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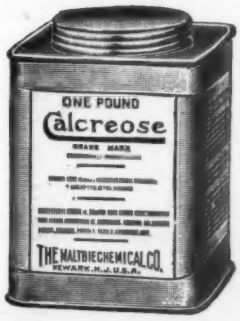

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Original Communications

PRESIDENT'S ADDRESS.*

By E. C. S. Taliaferro, M. D., F. A. C. S., Norfolk, Va.

Mr. Chairman, Members of the Medical Society of Virginia, Ladies and Gentlemen:

I am put down on the program, as you will observe, to deliver an address to the medical profession, and to the public, but I cannot dignify my remarks by calling them an address.

Before taking up the subject which I wish to present to you, I first wish to thank the medical profession in the State of Virginia, for the honor which they conferred upon me at their last annual meeting, in Lynchburg. I feel the honor most keenly, and shall always appreciate and look upon it as one of the greatest honors that can be conferred upon any member of the Medical Association, or upon any other man, to be made President of so noble and intelligent a body of men.

I have not come to praise the medical men in Virginia for the great strides and progress which have been made in the medical science during the last two decades; I have not come to tell the public how great and noble a profession we represent; but I have come, principally, to talk briefly upon certain matters that pertain more to the public welfare than they do to the physician. I wish to emphasize one point particularly, which has probably given rise to more misunderstanding on the part of the public than any question which has been presented,—being that of the Medical Practice Act: but, before discussing this, I should like to again emphasize what modern medicine has done, is doing, and will continue to do.

I might classify physicians into two large groups. First: those men who have given their time and brains for the development and thorough understanding of scientific problems. These men do research work, animal experimentation, and study the histology, physiology, and pathology of the various organs and tissues of the human system; finding out the most minute function of each cell, and teaching the co-relation of the whole human system, so as to enable those who practice medicine and surgery to have a clearer and more definite conception of the process of dissolution and repair.

I am aware that many of you, and the public at large, have been opposed to vivisection and animal experimentation, whereby we may determine the cause of diseases, and the cure and prevention of them. Is it not far better to sacrifice the life of a guinea pig, or a rabbit, or a white mouse, than it is to sacrifice the life of a human being? Is it not far better that these experiments be tried out to determine their actual good, than it is to allow man to stumble in the darkness and be unable to solve the mysteries? These conscientious physicians study the prevention of diseases, giving their time and thought, that you may live and be as free from disease as possible. But for this experimental work and study, we would still have with us disastrous outbreaks of yellow fever, typhoid fever, smallpox, and various other contagious or infectious diseases.

The medical profession are standardizing themselves as well as standardizing the hospitals. A few years ago many hospitals were nothing but boarding houses, into which patients were carried, treated, operated upon and discharged, without histories, and frequently without diagnosis made upon them. Today, thanks to the American College of Surgeons and the American Medical Association, this has all been changed. Today the hospital

*Address of the President before the fifty-third annual meeting of the Medical Society of Virginia in Norfolk, October 31-November 3, 1922.

staffs are elected and not appointed, thereby insuring better men. Today patients are admitted to the hospitals, a careful history is taken which includes previous illnesses, previous diseases, chief complaint, and a thorough physical examination is made, X-ray and blood findings included. Careful charts and records are kept. Progress notes are made daily. The surgical cases are given a preoperative and post-operative diagnosis, and a careful study of the pathological findings is made.

A few years ago, anyone was allowed to operate in a public hospital, whether equipped or not, if he obtained the patient's consent, and the patient was willing to stand the consequences of inexperienced surgery. This has been changed. The hospital boards today require a man, before he is allowed to operate, to show his credentials, his past training, and his experience. At the monthly meeting of the hospital staff all deaths are analyzed. Each doctor must be present and give a strict account of what he did, and why he did it: what medicines were given, and what technique carried out.

Now, why have I explained all this? It is simply because when the Medical Act, requiring a Medical Examining Board of Doctors, was first passed in Texas in 1873, and soon adopted by all the States in the Union, the public looked upon it as a medical trust, that was formed to keep other forms of practice out, but it was not. It was done, purely and simply, to protect the public.

Since that time there have arisen many cults for the practice of drugless healing, rubbing, neuropaths and adjustments, and other different types of quackery. They are men mostly without education or training in the Medical Science. At each session of the Legislature, these different cults present a bill authorizing a Practice Act, whereby they may be enabled to practice their so-called "profession." Can anything be more absurd? Can anything be more disastrous than to turn loose upon the public people who advertise in flaring words, claiming to cure each and every disease by some simple adjustment? Claiming to cure cancer by rubbing, when the medical profession knows, and you know, that by manipulating a cancer you spread cancer cells throughout the whole system? Can anything be more absurd than trying to treat diphtheria by adjusting some nerve, when we know it is a germ disease, and that a dose of antitoxin given in time is a life-saver? Can anything be more criminal than to turn loose upon the public this type of quackery? They advertise that no diagnosis is made, and none necessary. What will be the result? The result will be that the contagion will soon spread, all of the good work in preventive medicine will be thrown away, and the sick will be made worse.

Why has all this come about? Why have these cults developed and thrived for a short time? It has been because of the laxity of the medical profession in failing to teach the public the real prevention and cure, and lack of interest on the part of the public. They have been at a standstill, and have taken no active part in this great and important subject of their health. What is the remedy? Higher education. There should be a Medical Practice Act requiring all who attempt to treat disease, it matters not by what means or method, before they are allowed to study medicine in any form, to be thoroughly educated; that their medical education should consist of all the branches of modern medicine. They should study at least four years in a medical institution, they should be required to serve as an interne in a hospital in Class A. They should be required to stand a rigid examination by the examining board. No matter what branch of medicine they wish to enter, they should all stand a similar examination.

It is time that the medical profession and the public should take definite action in these matters pertaining to the prevention of disease and the preservation of health. Pulling the bars down and turning loose on the public these different forms of quackery will soon have a most disastrous effect upon the health conditions in the State of Virginia.

Many of these men have employed lawyers, who travel from state to state to fight their cases for them, thus pushing down the throats of the unsuspecting public this deception.

It was my duty and pleasure, during the last session of the Legislature, to go before various committees, at different times, in behalf of the Medical Practice Act, and, when conditions were explained, they were always willing to render us such service as they could for the betterment of health conditions in the state, and I call upon you as true American citizens, and as true sons and daughters

of Virginia, to stand by and require the highest education of all those who attempt to deal with health problems.

While demanding that there should be a higher standard of education for those dealing in medical problems, I do not mean to infer that they should be over-educated, or make the bars too high. By demanding an extreme education, I truly believe that it would be a drawback to the country districts, for when a man is over-educated he will not practice medicine in rural districts. Medical education should be, to a large extent, controlled by the state. I mean by this, that it should not be too expensive. There are many poor boys, bright and intelligent, who could study medicine today and be a credit to the medical profession, were it not that the expense of obtaining a higher education is beyond their means. The state should endow its medical schools, equip them thoroughly and make the expense of securing a medical education as low as possible, thereby putting it within reach of the ambitious and intelligent youth who is practically without means and who cannot afford to attend four years in a medical school at the present rate of board and tuition. The academic colleges in the state should give a pre-medical education. By doing this it would probably cut off one year from the medical school.

The subject of medicine has gotten to be a big subject. It is no longer a one-man proposition. We have to have specialists—men trained in certain lines of medical science—and I believe that no man should be allowed to be a specialist on any subject until he has had a thorough training on all lines, and has had two or three years in general practice. The surgeon should be thoroughly trained in diagnosis and in internal medicine, and should be enabled to differentiate medical cases from surgical cases. He should not be a mere carpenter and operate solely upon the advice of the internist. The internist, on the other hand, should have a thorough knowledge of the surgical subjects. He should know good surgery and a good surgeon when he sees one. He should visit the operating rooms and study living pathology. The genito-urinary specialist should have a thorough knowledge of skin lesions; in fact should be a specialist upon skin diseases as well as upon his special branch. The neurologists must have a clear conception of the internal secretions, and in fact of every branch of medicine. The public should differentiate between a good doctor and a poor one. All doctors should visit clinics every year, join a reading club and have a free and open discussion of all subjects pertaining to medicine.

I do not believe there is a single member of the Medical Society who is illegally prescribing whiskey, but, if he should be breaking the Volstead Act, he should be admonished of his error and, if he continues to do so, the Society should take a firm stand and expel the member.

The Society has always taken an active part in the campaign for the prevention of cancer. At the last annual meeting they appointed a committee on cancer, and I hope that they will bring in their report at this session.

Before closing, I wish to thank all of the officers and members of the Society for their loyal support and their wonderful help during the last twelve months.

New Monroe Building.

A CONSIDERATION OF DEFICIENCY DISEASES: DISEASES RESULTING FROM FAULTY DIETS.*

By JOSEPH GOLDBERGER, Surgeon, U. S. Public Health Service, Washington, D. C.

Of the advances in science that in history will mark the first quarter of the twentieth century none is of more fundamental importance to mankind than those in the domain of chemistry by the application of which an animal may be successfully fed on a synthetic diet throughout the normal span of its life.

As is well known, it was long believed that protein, carbohydrate, fat, inorganic salts and water were the essential dietary components. Singularly enough, however, all attempts to carry this belief into practice by feeding experimental animals on such purified nutrients sooner or later ended in failure. This led to the suggestion being put forward, first by Lunin (in 1881) and later, independently and more definitely, by Hopkins (in 1906) that there must be dietary factors other than these basal constituents.

These suggestions which, curiously enough, attracted very little attention at the time, had their origin in purely biochemical studies of

*Opening paper presented by invitation in a symposium on "Nutritional (Deficiency) Diseases" at the meeting of the Medical Society of Virginia, in Norfolk, October 31-November 3, 1922.

nutrition. Contemporaneous with them, studies were in progress in the domain of pathology the results of which pointed to exactly the same thing, for the investigations starting with and stimulated by the pioneer researches of Eijkman (1897), of Grijns (1901), and of Braddon (1907) in beriberi, and of Holst and Froelich (1907) in scurvy, indicated quite clearly that these diseases were intimately associated with diets lacking some unknown factor.

It is almost exactly ten years ago that Funk advanced the view that the diseases beriberi, scurvy, pellagra and possibly rickets constituted a group of "deficiency diseases," the primary etiological factor in each of which is a deficiency in a substance of a new class named by him vitamin. The experimental proof that converted this hypothesis into fact, so far, at all events, as beriberi and scurvy are concerned, is the fruitful result of the researches of the very recent past. As a result it is now accepted that beside the food factors known of old there are essential for mammalian nutrition at least three others now commonly referred to by the name suggested by Funk.

Doubtless by reason of their novelty and their mysterious character the vitamins have attracted an extraordinary amount of attention, both from the profession and the laity. Indeed, so much has this been the case as to make it almost seem as if these were the only dietary factors of importance, and to have led many hastily to assume that any and all nutritional disturbances, or disturbances only suspected of a nutritional origin, must be due to deficiency in factors of this class.

The purpose of this paper is to point out briefly the essential nature of the so-called deficiency and related diseases and to invite attention to the need of a broader conception of these than now commonly obtains. Time will not permit much detail nor the consideration of other aspects of these disturbances such as their relation to the endocrines, an aspect, by the way, that tends to invoke discussion of a volume inversely proportional to the mass of fact at hand.

It will be helpful to an understanding of the "deficiency diseases" to, first of all, consider briefly some of the more outstanding characters of the substances the existence and need of which have only just been recognized.

It has already been mentioned that the existence of three vitamins is now well recognized and accepted. These are specifically designated as vitamin-A, vitamin-B, vitamin-C, respectively. Within the past few weeks evidence has been brought forward by McCollum and associates of the existence of a fourth which, if confirmed, will, under existing nomenclature, be designated as vitamin-D.

These complexes are widely but quite unevenly distributed among our natural foodstuffs. Thus, to consider a few typical examples,—the whole corn kernel contains considerable vitamin-B, a little vitamin-A but no vitamin-C; the ordinary dry legume seeds, beans and peas, are very rich in vitamin-B but are devoid of both -A and -C. Spinach is reported to contain some vitamin-B and much of -A, while raw cabbage and tomatoes contain all three but are particularly rich in -C.

Originating primarily by synthesis in plants the vitamins are present in animal tissues and secretions, with rare exceptions, only as the animal secures them in the food, herbivores directly and carnivores indirectly, from the plant. In animal, as in vegetable foods, the distribution of these essentials is very uneven, the efficiency of the different organs and tissues as reserve depots apparently varying markedly. Milk has been found to be notably rich in vitamin-A but to contain relatively only moderate or only small amounts of -B and -C; muscle meat contains all three vitamins, but in very small amounts; whereas such organs as the liver and kidney are very rich in both -A and -C and only moderately supplied with vitamin-B. It is of great practical importance to recognize that this naturally occurring inequality is frequently accentuated and greatly modified by the treatment (milling, heating), to which many of our foods are subjected and which has arisen as a result of the practical necessities of distribution and marketing of present-day civilization.

Chemically still unidentified, the vitamins are recognizable at present only by the pathological results of their withdrawal or absence from the diet. An inadequate supply of any one of them is followed by disturbances shown in experimental animals by a more or less marked reduction in appetite, retardation or cessation of growth, and, sooner or later, nutritive failure. Besides these general symp-

toms, an inadequate supply is also followed by certain effects more or less distinctive of each,—thus, deprivation of vitamin-A, if of sufficient degree, may lead to ophthalmia, the xerophthalmia of McCollum; of vitamin-B, to nerve degeneration with disturbed sensory and motor nerve function and symptoms of polyneuritis; and deprivation of vitamin-C to hemorrhages, particularly subperiosteal and along muscle sheaths. Vitamin-D, if it be not premature to so designate it, is concerned in calcium metabolism. A deficiency of this substance in connection with a faulty calcium-phosphorus ratio in the ash of the diet when coupled with inadequate sunlight leads to disturbance in calcium deposition in growing bones.

The syndromes thus resulting in animals are the analogues respectively of keratomalacia, beriberi, scurvy and rickets in man. Incidentally, it may be remarked, in view of the continued agitation in some quarters against animal experimentation, that our knowledge of the etiology of these diseases of man, so long obscure and perplexing, is now solidly founded on the results of experimental study of the corresponding condition in animals. And the possibility of substantial further progress depends directly on the possibility of further animal experimentation.

Let us now consider these diseases individually with respect to the dietary factor specifically concerned in their etiology. The dependence of keratomalacia or vitamin-A deficiency is so well established by recent studies that discussion of it at this time would seem to be unprofitable. Reference may well be made, however, to a clinically similar eye condition in rats recently described by McCollum and associates found to be due not to vitamin deficiency but to a faulty mineral balance, particularly with respect to chlorine and sodium. The possibility that an eye condition may occur in man analogous to this newly discovered one in rats makes this of importance to the clinician.

Beriberi and scurvy are the classical types of vitamin-deficiency diseases. The former arises as the result of a deprivation of vitamin-B, the latter of vitamin-C. The occurrence of the former has most commonly been associated with a diet in which white, highly milled rice was an unduly large element; the latter with a diet in which fresh vegetables formed an unduly small element. All this is now so well known that simple mention of these broad, general facts is all that is called for.

The status of rickets as a vitamin-deficiency disease is, however, on quite a different footing. Mention has been made of the fact that a factor, probably of the nature of a vitamin, which may tentatively be referred to as vitamin-D, may play a part in the development of this disease but it should here be made clear that this relation differs in a fundamental respect from that which obtains between vitamin-B and beriberi, or of vitamin-C and scurvy. In rickets the part played by the vitamin—if such should indeed prove to be the nature of the factor—is not, as in beriberi and scurvy, under all circumstances an essential one. In rats, at least, it appears to be needed only, as has already been mentioned, when there exists a faulty balance between calcium and phosphorus in the diet and then only in circumstances of insufficient sunlight. Indeed, some students of the disease regard this insufficiency of sunlight as the fundamental factor in the origin of the disease, basing themselves largely on the fact that the greatest incidence of the disease is in the late winter and early spring, that is, at the end of a season of reduced sunlight. But the absence of the disease in certain northern latitudes (New Hebrides) under circumstances of but little light during long seasons, the greater incidence in artificially than in breast fed children, together with the experimental evidence now at hand, point in our judgment, to diet rather than to light as the primary controlling factor. In either case, however, it is clear that rickets can not properly be considered a vitamin-deficiency disease. And what has been said of rickets probably applies fundamentally equally to osteoporosis and to the hunger-osteomalacia observed since the war in Austria.

Besides the diseases that have been so far considered a number of others have from time to time been mentioned as dependent on vitamin-deficiency. Among the most conspicuous of these are tropical sprue and pellagra.

There is much to justify the opinion long held by some observers that an important relation exists between diet and sprue. Perhaps most significant in this connection is the high esteem in which the dietary treatment of this

disease is held by practitioners in the tropics. There is practical unanimity among them as to the outstanding value of a diet of milk or meat, or of a combination of these with fruit, particularly strawberries. But even if it were justifiable to accept this as proof of a close relationship and indicative of dietary deficiency, one could hardly do more, on the basis of the meagre evidence at hand, than guess as to just what specific dietary factor or factors are involved. If we were to venture a guess, the striking resemblance of its symptoms to some of those of pellagra would lead us to suggest that the etiological dietary factors in sprue may possibly prove to be of a nature similar to those in pellagra. In connection with sprue, passing reference may be made to "Coeliac Disease," a condition in children first described nearly fifty years ago by Samuel Gee and quite recently carefully studied by Still. Clinically, it resembles sprue in several striking respects but the etiological factors are so obscure that little more can be said than that it is not unreasonable to expect that the condition will prove to be of dietary origin; it is pure speculation, however, to talk of vitamin-deficiency in relation to it. This applies with even more force to another even more obscure condition in children, reported in this country in the last year or two under the name "acrodynia" (Weston), and "pellagra-acrodynia" (Byfield), but in all probability identical with the "erythroedema," first described in Australia about eight years ago (Wood). Much careful study, clinical, epidemiologic and dietary, of all these conditions will have to be made before even their broad dietary relationship can be postulated other than most tentatively.

The relation of diet to pellagra was, until quite recently, as obscure and doubtful as it still is to sprue. But the results of investigations carried on during the past seven or eight years have gone far towards clearing up this well-nigh two century old problem.

Evidence has been brought forward which indicates that diet operates as the dominating factor in controlling the clinical course and outcome of an attack of this disease. Furthermore, the results of experimental feeding on a considerable scale of pellagrous children in orphanages and of pellagrous insane in a hospital for insane warrant the conclusion not only that diet controls the course of the immediate attack but also that the clinical recovery thus brought about continues and no new cases develop so long as a proper diet is maintained, and this without the intervention of any other factor, hygienic or environmental. This pellagra-preventive effect of diet, it may be noted, is represented not merely by a more or less marked lowering of incidence but actually by a complete disappearance of the disease. In this respect it has striking analogues in such diseases as beriberi and scurvy, in which the same notable phenomenon has long been well known.

Just as in treatment and prevention, so directly in the causation of pellagra the available evidence points to diet as the controlling factor. Considering only the direct experimental evidence we find that all reported attempts to induce the disease by means other than diet have failed, whereas in a controlled human feeding experiment with a diet the outstanding character of which was a protein supply derived almost entirely from a mixture of cereals—maize, wheat and rice—not less than six of a group of eleven men who submitted to it developed the disease (Goldberger and Wheeler).

Since an adequate increase or a liberal addition of milk and lean meat to a pellagra-producing diet, without other modification, will prevent the occurrence of the disease, it is thus clearly suggested that in pellagra we have the manifestations of a dietary deficiency. With respect to the dietary factor primarily concerned in this deficiency the evidence has for some time increasingly tended away from vitamins, and, as we shall presently see, some observations recently made by us (in association with Dr. W. F. Tanner) well-nigh, if not absolutely, eliminate the known vitamins as essential factors.

In the course of our study of the prevention of pellagra in a section of the Georgia State Sanitarium, we noted the occurrence of a number of cases of the disease in individuals who, during a period as long as three or four months before the onset, had daily consumed a diet the vitamins in which were derived from almost every known class of vitamin-rich foods, including cod liver oil and baker's yeast, that in the aggregate must have supplied an abundance of these complexes. This diet is believed to have afforded also a liberal supply of minerals since it included a supplement of

mineral solutions yielding approximately the mineral elements of the ash of a liter of milk. Under these circumstances it would seem permissible to exclude known vitamins and minerals, thus leaving but protein for consideration as the essential primary factor involved in the deficiency.

This interpretation is very greatly strengthened by the indications afforded by another case recently observed by us (in association with W. F. Tanner). This was in a colored patient who developed an attack of pellagra after three months on a diet which, so far as could be judged, was so constituted that, if faulty, the fault was most probably connected with the protein which was derived practically exclusively from 24 ounces of milk. After nearly three weeks of a progressive development of symptoms a preparation at first of calcium caseinate, later of a high grade casein, was added to the diet, and the fresh milk replaced by an equivalent volume of skim milk in powder form, thus bringing about, significantly, only an increase in the protein. This modification was followed by prompt clinical improvement although the previous progress of the case and experience with some other similar cases had impressed us that no amelioration of symptoms was to be expected without an appropriate change in diet.

The indications are therefore very strong that the dietary deficiency is one involving not vitamins and minerals but protein, and, since the present-day conception regards protein as a complex of amino-acids, that it is some amino-acid deficiency that constitutes the primary specific factor* in pellagra. We have here, in all probability, therefore, a type of deficiency disease fundamentally different from that represented by beriberi or scurvy.

It thus becomes evident that the conception of deficiency diseases must be extended to include this new type represented by pellagra. But recent developments in our knowledge of another disease, one which ordinarily is scarcely thought of in this connection, seem to us to suggest that this extension should be carried still further.

The etiology of endemic goitre has long been obscure but the work of Marine and associates seems to us to indicate with increasing clearness that this condition arises primarily from an inadequate ingestion of iodine. Marine's demonstration in school children of Akron, Ohio, confirmed by Klinger in Switzerland, that this condition can easily be prevented by the administration of a small amount of sodium iodid appeals to us as in the highest degree suggestive, if not entirely conclusive. But whether this view of the etiology of endemic goitre is as yet entirely acceptable or not, it nevertheless serves to indicate that serious consideration must be given to the possibility, if not the probability, that deficiencies in the mineral factor in diet may give rise to more or less specific pathological conditions in man.

Accordingly, it would seem advisable to further extend the conception of deficiency diseases so as to include those due to mineral deficiencies, of which endemic goitre may, at least tentatively, be regarded as a type.

This broader conception would thus include all of the diseases that we have seen to be dependent on deficiency of an essential dietary factor. It does not, and, in the light of the evidence at hand, should not include rickets, for, as has already been pointed out, if we accept the dietary view, this arises primarily not from a deficiency but from a faulty balance of the mineral elements of the diet. As we see it, then, we have in rickets a disease of dietary origin, which is related to the deficiency diseases but is not strictly one of them. This suggests the desirability of a grouping broad enough to include the dietary deficiencies and also such related diseases as rickets. Fundamentally all these conditions, including rickets, arise in consequence of faulty diets and it would thus seem entirely rational to bring them together on this basis as diseases arising from faulty diet.

Such broad classification appeals to us as having rather important advantages. In our review of the individual diseases arising from faults in diet, reference was made only to the primary distinctive dietary factors, but this is not to be understood as indicating that other dietary factors are never involved. Quite the contrary is certainly frequently the case. This may be deduced from the newer knowledge of the dietary properties of our foods which indicates that a diet faulty in one respect is almost certain to be defective in some degree in other respects, and is borne out clinically by the occasional occurrence of cases in which there

*This does not exclude the possibility, indeed the probability, that other factors, dietary and non-dietary, may (perhaps frequently do) operate either to accelerate or to retard the action of this primary factor.

may be observed an association of scurvy with rickets, of scurvy with beriberi, of pellagra with beriberi, or of scurvy with pellagra. It follows, therefore, that almost always the diet associated with a specific clinical condition, whatever it may happen to be, may be expected to be faulty not only with respect to the factor that gives the clinical entity its distinctive character but, in some degree, also with respect to one or more other factors. Such condition is therefore more accurately described as a disease of faulty diet than as a deficiency of this, that, or other factor even if all the defects were of the nature of deficiencies.

This broader classification avoids the implication that otherwise may appear to be suggested, that the primary specific factor is the one exclusively concerned in bringing about the clinical condition as it actually presents itself. It thus permits of a more ready appreciation of the fundamental importance of a diet adequate in all respects, for it tends to suggest that in dealing with such diseases attention must be given not alone to some one specific factor but also to the make-up of the diet as a whole.

In closing, it is desired particularly to emphasize one thing that emerges from this discussion, namely, the dominant importance of a properly constituted diet. Such a diet is essential not only in treatment and prevention but also in the promotion of the highest physical development and vigor of which the race is capable.

Hygienic Laboratory.

PEDIATRIC ASPECTS OF NUTRITIONAL DISEASES.*

By LAWRENCE T. ROYSTER, M. D., Norfolk, Va.

It would be well to state in the beginning what diseases or conditions are considered at the present moment as proved to be due to a food or food factor deficiency, and which ones are probably of analogous etiology, though still *sub judice*. Those conditions concerning which the authorities agree positively as being of deficiency origin are scurvy, beriberi, xerophthalmia and keratomalacia (probably different clinical aspects of the same underlying condition). Those concerning whose etiology opinion is yet divided, in which positive proof is lacking though strongly in favor of deficiency, are pellagra, acrodynia, rickets, with its closely allied spasmophilia and tetany; while the single outstanding classical condition which represents the truest type of deficiency disease, though not a food deficiency, is cretinism. We must not lose sight of the faulty development and early decay of the teeth, which we are coming more and more to recognize as a manifestation of malnutrition at some time between conception and their eruption; in fact, in many instances they furnish us the only clue to an underlying malnourished state.

I shall review briefly the clinical manifestations of each of these conditions, emphasizing particularly the difference between the symptoms in the adult and the child, and dwelling at some length only on the ones which are of interest to us in this particular section of the country. The order in which I have mentioned these conditions will therefore be disregarded in the general discussion.

Beriberi is a disease of proved deficiency origin, though it does not always develop on the same gross diet. This is shown by the fact that while it is most frequent in China, Japan and certain insular localities where the diet is more or less similar, it has been seen in Scandinavia, Labrador, and in epidemic form in asylums and other institutions in the United States. Whenever it occurs, however, there is a demonstrable deficiency in the water soluble B vitamin. The manifestations in the adult and in children do not differ materially, and it is not of sufficient interest to those of us living in this section of the country to justify a discussion.

Pellagra. Though most frequently seen in the adult, this condition is by no means rare in children. It is rarer in infancy, though it does occur, even in the breast-fed, and after the second year is common enough to be considered with children's diseases. It is quite prevalent in the Southern states. In this section, however, I have personally never seen a case. The warm months of spring, summer and early autumn furnish most of the cases. The etiological factor is probably a food deficiency—more specifically a protein deficiency. A prolonged carbohydrate diet, or at least one poor in proteins, appears to be provocative. When it occurs in infants it is

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usually the nursing infant of affected mothers; though instances have occurred in which non-affected mothers have infants who are pellagrous.

There is some disagreement still among the authorities as to the exact nature of pellagra —a few still leaning to the infectious nature, though the weight of authority is undoubtedly on the side of an unbalanced diet. No vitamin, however, has been proved a definite factor. Clinical manifestations are practically those seen in the adult. The eruption is first seen on the extensor surfaces of the extremities, then becomes more or less general. This eruption is of such a nature in the early stages that it is often mistaken for sunburn, especially when it occurs in the warm months; it rapidly becomes scaly, however, and eventually exfoliates large, dry scales. This is not universally the case; sometimes bullae are seen. The eruption is symmetrical and sharp in outline except when receding, and it usually leaves a brown discoloration of the skin. The child shows the same type of disturbance of the digestive tract as the adult. The gastric manifestations are exceptional, while the intestinal ones are quite characteristic. Diarrhea is the rule—either continuous or alternating with constipation. The diarrhea is either simple or mixed blood and mucus. The nervous manifestations, beyond restlessness and fretfulness, are rarely so marked as in the adult. I have no doubt that pellagra when mild is often overlooked, and that even in our section occurs with greater frequency than we realize.

Acrodynia. The exact etiological position of this condition has not been determined. The weight of opinion is on the side of deficiency, though there are those who still hold to the infectious theory. Opinion also differs as to whether this condition is a variant form of pellagra or is a distinct entity. This was early described under the title "Erythredema," and this is probably the best name for it. The manifestations are striking—loss of appetite and listlessness are constant. In certain groups there is a striking incidence of infection of the respiratory tract, while in others there is no such infection apparent. Loss of weight is usually the rule. Reflexes are diminished (probably exaggerated early). Profuse perspiration is almost universal at first, and this results in maceration of the skin. The irritation causes violent scratching. The hands and feet are cold and bluish red. The characteristic symptom, as stated by patients who are old enough to express their feelings, is the complete perversion of sensation in the hands and feet,—when walking on a rough surface the sensation is that of velvet, and *vice versa*. Photophobia with red conjunctivae is marked, and there is a characteristic area of necrosis of the buccal surface, usually opposite an erupting tooth. The hair is shed, teeth fall out, and there are changes in the nails. Diagnosis may be difficult in the early stages from scarlet fever; later it may be suggestive of pellagra; at all times it may be mistaken for beriberi. Certain writers have described this condition as a variant form of peripheral neuritis. No vitamin has as yet been proved a determining factor; and no definite type of food has been shown to be even suggestive etiologically, though a well balanced diet is essential to cure.

Xerophthalmia and Keratomalacia, long considered infectious in origin, have been proved to be due to a lack of a fat soluble A vitamin. This condition may come on in the course of any deficiency disease, may come on without any evidence of the presence of one of the deficiency diseases, or may come on as the only manifestation of malnutrition. When the diseases have not advanced too far they are cured by the administration of codliver oil, and uniformly prevented by its administration. They are not very common in this country, but in Japan there have been as many as 1,200 or 1,400 cases in a single outbreak, where it is described under the name "kikan."

Rickets is one of the conditions of childhood with which we are most frequently confronted, and one which perhaps furnishes as many patients to the physician dealing exclusively or in part with young children as any other condition known in the temperate zone. The frequency of rickets is variously estimated by different observers. The most recent observers place its incidence in breast-fed infants at about 50%; while among the artificially fed children the figure closely approximates 95%. Its position in relation to etiology is as yet not definitely determined—one group of observers holding entirely to the food deficiency theory, while another places it among those caused by unsanitary conditions. (Vitamin D?) The most pronounced cases seen along the Atlantic seaboard are in the Negro and Italian races, both of which imme-

diately or remotely have been transported from a sunny clime where most of the life is led out of doors, to one which, at least during the winter months, requires close housing and a good deal of artificial heat. However, this condition is not limited to these races, but, to a large extent, sometimes detectable only by X-ray or the presence of a very slight rosary, it is becoming well nigh universal. We are all quite familiar with the type of advanced rachitic infant. From the fourth or fifth month up to the first year we see this infant with large, square head, ribs beaded, enlargement of the epiphyses, which is symmetrical, and curvature of the bones. Early symptoms, and ones which should attract the attention of the examining physician at once are sweating of the head, which is often flattened, constipation and craniotabes. The fontanel is late in closing. Etiologically, as has been stated, the condition is not fixed. One thing is certain, that there is marked disproportion in the blood serum in the normal calcium-phosphate ratio. Normal bones contain two-thirds inorganic and one-third organic constituents. This proportion is reversed in marked rickets. In experimental work, rats and dogs acquire rickets readily when fed a diet either deficient in calcium-phosphate, or one in which the proper calcium-phosphate ratio is not maintained. This is particularly noticed when the substance contained in codliver oil is not administered at the same time; and that rickets will not develop if the ratio is properly maintained, even if there is a deficiency of the substance contained in codliver oil. These experiments would certainly tend to prove that it is a dietary condition, and probably belongs to the class of true deficiency diseases. And yet, when we take into consideration further experiments that sunlight, even without the administration of codliver oil, will effect a cure in rickets, or even exposure to a carbon arc lamp, we are led to believe that hygienic conditions play as important a role as food itself. It is not at all unlikely that a combination of these factors is at fault. It is quite possible that the organic salts are deposited in the bone in the presence of sunlight, or the equivalent artificial light, which would not be deposited if these two are deficient, and that in all probability the continuance of the patient in a strictly hygienic environment might prevent the development of rickets even in the face of the deficiency of certain food elements. Recent investigations have shown in a certain number of cases where infants showed varying degrees of rickets, that the diet of their mothers was deficient in the calcium-phosphate ratio. It is quite certain that a combination of sunlight and codliver oil will cure rickets. This, however, does not relieve us of the responsibility of having the child fed properly, on a well balanced diet, and the mother's food during her pregnancy and period of lactation carefully watched and balanced with as near scientific accuracy as practicable.

Closely related to, if not invariably associated with rickets, are TETANY and SPASMOPHILIA—different clinical manifestations of the same underlying conditions. These may or may not be food deficiencies, but since they are calcium deficiencies and are relieved by the administration of calcium, they should be considered in this connection. A striking feature of the appearance of these conditions is that they do not occur in cases of rickets presenting marked bony deformities, but do occur where deformities are slight (calcium-phosphorus ratio). In frank tatany we have a general spasticity of the body with a very apparent carpo-pedal spasm. In spasmophilia, there is, as the name implies, a marked tendency towards convulsions. It is entirely probable that a child who has convulsions in the presence of fever or digestive disturbances is a victim of spasmophilia, especially where the convulsions are of long duration or of frequent occurrence.

In addition to these manifestations we have laryngismus stridulus, breath-holding spells, and the like. Chvostek's sign and the peroneal reflexes are usually, though not invariably, present; while Erb's sign—response of muscles to low galvanic current—is practically always demonstrable. These symptoms if severe may be relieved by the hypodermic injection of magnesium sulphate. They are cured by the administration of calcium chlorid or codliver oil. Of course it is evident that a well balanced diet should be instituted and maintained.

SCURVY represents the only type of deficiency disease which can be positively prevented and entirely cured through regulation of diet alone. Identity of adult and infantile disease has long since been established. Certain dif-

ferences in the clinical manifestations are due to the reaction of the disease to the two kinds of tissue. To briefly outline the symptomatology in the adult:—there is usually first a change in the complexion—it is first sallow or muddy; there is loss of vigor, the subject becomes somewhat indolent, tires easily, is frequently out of breath. Fleeting pains in the joints and extremities are at least the cause of discomfort. Loss of weight does not occur. The gums become congested, spongy, hemorrhagic, while petechiae develop in the skin, especially around the hair follicles, the size of these varying from a discrete pin point to coalescing blotches. There is frequently nose bleed, and the eyelids are swollen. Constipation during this stage is the rule. All of these signs and symptoms gradually but steadily increase, and palpitation supervenes; the gums become more spongy and hemorrhagic, and if there is an infection or many carious teeth the breath becomes foul. The teeth loosen, and subcutaneous and submucous hemorrhages increase. Bloody diarrhea which takes the place of the early constipation sets in. Hemorrhages in the deeper muscles occur, and there may be brawny swellings which are tender. The appearance of this is often the first manifestation of the disease. Hemorrhages likewise occur in the sheaths of the tendons (notably the achilles). Sometimes there is a diffuse hemorrhage of the popliteal space. Edema of the ankles which does not pit, but on the other hand causes glossiness of the skin, is frequent. Some authorities state that follicular hyperkeratosis is the most frequent early sign. Subperiosteal hemorrhages are the rule, accompanied by pain and tenderness. They occur in almost any location, but are more frequent in the femur, tibia and jaw. Death may be due to sudden syncope from heart weakness, or from the pouring out of fluid in the pericardium, or from secondary infection or pneumonia.

In infants and young children the same underlying pathology exists, and the same changes as those already described, though not usually in the same order, nor in the same severity for each symptom. The acute florid type of scurvy is quite familiar. The child lies on its back with thighs and legs flexed and everted; it is exceedingly tender to the touch; usually a lump or mass appears along the shaft of one of the long bones of the extremities. This is frequently diagnosed paralysis, rheumatism or osteomyelitis; the last due to the fact that temperature is not infrequently very high in scurvy. In addition to these symptoms, almost invariably where teeth have erupted the gums are swollen, spongy and hemorrhagic. In the subacute form we usually have a child six to twelve months old with either a very slight gain or stationary weight, fairly well developed and nourished but pale, and frequently showing edema of the upper eyelids; appetite is poor and the child is irritable; the gums are livid and show evidence of peridental hemorrhage. These last may be so transient as to escape notice unless the child is under constant observation. There may be present the crimson line of Still. The papillae of the tongue are frequently enlarged; the frenum may be hemorrhagic. There may be subconjunctival hemorrhage in one eye. The thighs are often tender, either constantly or fleeting. A non-pitting edema of the tibia may appear, and the knee jerks are usually exaggerated. The urine often contains a trace of albumin with a few blood cells. The pulse is rapid and becomes irregular; the respiration is almost always rapid. Not infrequently there is a steady gain in weight, and the appearance of scurvy may not be definitely determined except on the X-ray.

Latent Scurvy. The symptoms of this condition may be very indefinite. We usually have a history that at about the 6th month the child began not to thrive well; the pulse is apt to be rapid and the knee jerks are exaggerated. Through history of the diet we are apt to make a correct diagnosis. The child has usually been fed on pasteurized or condensed milk over a long period, to which has possibly been added cereal. The latent form is exceedingly important, and often overlooked.

There are certain symptoms that are not characteristic in any one of the types described, but may be present in any one. Distinct hemorrhages may occur in the sheath or body of the muscles. The skin instead of having petechial hemorrhages may have diffuse hemorrhage, as also the mucous membrane. There may be proptosis, which is due as a rule to a hemorrhage in the orbital cavity, or more rarely to edema of the tissue surrounding the eyeball. Beading of the

ribs is not uncommon, and is naturally often mistaken for rickets. In the scorbutic beading, however, this is irregular and abrupt. Separation of the epiphyses may occur. Rarely the joints may be involved. Hemorrhages may occur in the membranes of the brain and lead to corresponding nervous manifestations.

Etiology.

Scurvy is almost universally a disease of the bottle fed baby, or in cases where the breast feeding has been continued only a few months. Sometimes where the quantity of breast milk is sufficient the quality may be poor, due to the faulty diet or malnutrition of the mother. It usually occurs in babies fed on pasteurized or condensed milk, or those on malted milk or other products which are not mixed with fresh cow's milk. It is due especially to a lack of the water soluble C vitamin. At least 1 pt. of fresh cow's milk per day is required to prevent scurvy in an infant, and this in cases where the milk is rich in vitamin content; where the milk is poor in vitamin it requires as much as a quart.

The food of the cow or nursing mother appears to be the determining factor in the quantity and type of vitamin contained in the milk produced. Prolonged slow heating, such as pasteurization and the process employed in condensing milk appears to destroy a large amount of the vitamin content, as is also the case when aging takes place. Rapid heating, such as boiling, and evaporation as used in the preparation of powdered milk, especially when the milk is subjected to these two processes while fresh, that is, within six hours of milking, appears to impair the vitamin content very little if at all.

The diagnosis of scurvy from purpura often presents a real difficulty, but can usually be cleared up by a count of the blood platelets. These are usually increased well beyond the normal limits in scurvy and diminished below the normal limits in purpura.

It would appear, therefore, in light of these recent studies that it is of vast importance to the growing child that it be supplied continuously with a well balanced ration, not only for the needs of growth and development, but also because we do not as yet know what bearing the food of childhood has on the state of nutrition in adult life; more particularly on the incidence of deficiency diseases.

All deficiency diseases are not invariably isolated in incidence, but two or more are frequently associated in the same individual. This fact, and the further fact, that they are almost always preceded by a state of malnutrition, not always demonstrable by the scale, is responsible for the later appearance of a definite syndrome, called by the name of one of the deficiency diseases, and dependent on which food or food factor has been most lacking in the diet. We are led inevitably to the conclusion that in deficiency diseases, as well as in infectious diseases, prevention is of more value than cure, and that the prevention as well as the cure in this instance depends on a well balanced diet.

Taylor Building.

ORTHOPAEDIC ASPECTS OF NUTRITIONAL DISEASES.*

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We would have described rickets, reviewed scurvy and mentioned beriberi as our part of this symposium had we not been present at the meeting of the American Orthopaedic Association in Washington last May. There Dr. Robert Osgood, in discussing Dr. Shipley's paper on rickets said that osteomalacia is a deficiency or a hunger disease and if osteomalacia is included, Paget's disease must be also. These five, then, will be taken up, starting with beriberi as the orthopaedist probably has least to do with this.

Beriberi.

Beriberi in its various forms produces pain and loss of power in the limbs, a lowering sensibility of the legs, with the occurrence of paraesthesia and oedema. The usual methods are used in treating the neuritis; salicylates and saline laxatives are used in Japan. When oedema has subsided, massage, passive movements, and graduated exercises are used in treating the atrophied muscles.

Scurvy.

Scurvy produces arthritic symptoms which may at first be taken for rheumatism. The child shows evidences of discomfort when certain joints, usually of the lower extremities,

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are moved, and as the disease progresses he may scream whenever he is turned or lifted. The painful joints are sensitive to pressure and they may be somewhat enlarged, but local heat and redness, as well as fever, are, as a rule, absent. In extreme cases, the swelling about a joint due to effusion of blood and accompanied, it may be, by separation of the epiphyses may be mistaken for the symptom of infectious epiphysitis or even for sarcoma. The enlargement may be confined to one of the bones forming an articulation. The thickening is due to periarticular or rather subperiosteal hemorrhage, and the joint itself is not usually affected though hemorrhage may occur.

Orthopaedic treatment consists of keeping the patient completely at rest and for this a gas-pipe stretcher frame, over which canvas is tightly drawn, is used. By this means, the child may be kept at all times in the proper position, and, at the same time, can easily be moved about without being disturbed.

Osteomalacia.

Osteomalacia lies in debatable ground. By some, it is considered to be a process somewhat similar to rickets in causing softening of the bones, the etiological and pathological relation of which to rickets is imperfectly formulated but the pathology of which is different from that of rickets. Whitman declares that it is a disease of an inflammatory nature, while Osgood, as we saw above, definitely places it among the deficiency diseases. Probably, after all, Lewin will eventually settle this argument for us, as he has written an excellent paper on both osteomalacia and adolescent rickets, of which we shall say more later.

Grossly, there is an absorption of the lime salts, beginning in the marrow and affecting first the spongiosa. Osgood believes that there is at first a decalcification of the bony tissue, that the calcium is in part replaced by magnesium but probably chiefly by an organic substance rich in sulphur, poor in phosphorus, similar to, but not exactly like, the normal matrix. At any rate, the resistance of the bone is so impaired that it bends or breaks.

The disease, one of adult life, usually begins insidiously, the first symptoms being dull aching and perhaps tenderness of affected parts and pain on motion referred to the pelvis and the thighs. Walking and sitting produce discomfort. This is, as a rule, supposed to be of a rheumatic nature until the weakness and deformities of the limbs make the character evident. The bones of the trunk are the ones most often involved although bowing of the arm and thigh with complete or incomplete fractures is seen. The cranial bones are seldom affected. An interesting point in connection with this is that the patient is shorter after having been up for a while; for instance he may be high enough to be able to see to shave in a certain glass in the morning, but not in the evening. Treatment is mainly general. If the process is arrested, existing deformities may be corrected in the same way that the same type of deformities are corrected in rickets, to be described later.

Paget's Disease.

The most complete metabolic studies of osteitis deformans have been made and described by Bergeim and Hawk. Their investigations revealed a decided retention of calcium, magnesium and phosphorus, and a pronounced loss of sulphur. Their findings were interpreted to indicate a stimulated osseous or osteoid formation, accompanying the absorption of a highly sulphurized organic matrix. In advanced osteitis deformans, the first step in the new formation of bone osteoid tissue may be the reduction of a highly sulphurized organic matrix which is transformed gradually by a calcification process, which is accompanied by the deposition of calcium, magnesium and phosphorus in this matrix. In the course of this calcification process, they suppose that a certain quota of the sulphur of the matrix is replaced by the other elements mentioned, a process which must entail the retention of calcium, magnesium and phosphorus, and an accompanying increased elimination of sulphur. They believe that the metabolic picture of osteitis deformans is, to a certain extent, new in osteomalacia.

The gross pathology is made up of the deformities of the long bones, most commonly outward and forward bending of the tibia. The femur follows in frequency. The cortex is thickened most on the convex surface and the outline is wavy there. The joints are scarcely ever involved, although in advanced cases there may be limitation of the joints as in coxa vara, etc., due to thickening deformity

of adjacent bones. There are more fractures in individuals suffering from the disease than normally. The bones of the lower extremity are usually most manifest probably because of weight bearing. The involvement is usually symmetrical, although cases are on record in which the disease was limited to one-half of the skeleton. Lewin believes that the condition is a combination of two definite pathologic conditions, namely, osteoporosis followed by osteosclerosis, that the condition begins as an osteomalacia with softening due to the abnormal interrelationship between various chemical substances in the bone. During this stage deformities occur. Then, for some unknown reason, the condition of osteomalacia disappears and is replaced by osteosclerosis, during which stage the cortex of the bone assumes a certain hardness which is characteristic of advanced osteitis deformans.

Signs and symptoms include a slow onset extending over a period of months or years. There is usually a vague rheumatic history. Finally, there is gradually weakness of lower extremities, tenderness along the shafts of long bones and a long story of gradual decrease in height. A cervico-dorsal kyphosis appears and the abdomen becomes scaphoid. The patient becomes "simian" in appearance.

The X-ray findings show a rarefying osteitis with a thick cortex due to subperiosteal and medullary new bone formation. The bone has the appearance of cotton wool in both diaphysis and epiphyses. There may be seen bony striations extending out into the soft tissues and areas of rarefaction.

Preventive treatment is impossible because of the difficulty of diagnosis before deformity has set in. Curative treatment at present is impossible. Corrective treatment may be inadvisable because of the age of the patient and the probability of failure.

Goldthwaite, Painter, and Osgood reported a case which suffered a fracture of the afflicted thigh from a severe trauma. The broken bone healed with apparently normal rapidity and firmness. This encourages them to recommend osteotomies for the correction of markedly but slowly developing deformities, especially of the lower limbs.

Abbe found excellent operative repair of bones affected with osteitis deformans. He cites two jaw cases operated upon with perfect results.

Rickets.

It is our impression that in the general discussion rickets will not be sub-divided as it will be necessary for us to do. Also we are sure that the excellent papers of others will leave nothing to add to the etiological and metabolic factors. We are then able to pass directly to the pathology, deformities and treatment.

From the orthopaedic point of view, there certainly are three groups to be considered; fetal rickets, infantile rickets and adolescent rickets. It is with the second group that we are most familiar, and of which we think when we speak of just rickets. However, Jansen, in a recent very philosophical paper on coxa plana introduced the idea that changes here were biological, and in his monograph on achondroplasia, the fact is very evident that he believes that metabolism is interfered with by amnio-pressure. In other words, the elements which go to prevent rickets are present, but their use is prevented in certain bones by the increased pressure on the amnion. As to the adolescent rickets, Freiberg positively says that there is such a disease, and Lewin has recently reported two cases with an excellent discussion of the condition.

Fetal Rickets.—Achondroplasia. Although Ptah was worshiped by the Egyptians, and there dwarf-like people were always considered very desirable gifts for returning conquering heroes to present to their kings as court-jesters, Osler first described a case fully in 1888 and at that time called it fetal rickets. Since that time the cause was not at all understood, various factors being given as etiological, until 1917 when Jansen published his work advancing the theory that pressure in the amnion between the third and eighth week of fetal life produces the changes.

The deformities consist of two types; those produced by infolding and those produced by dwarf growth. The deformities produced by infolding are the sunken nose-bridge, the kyphos baseos "cranii" and the kyphos in the spine from wedge-shaped vertebrae. The deformities of dwarf growth are those in which certain bones are below normal in length when compared to the length of the body. It is the segment that is proximal to the body that is affected, that is, the humerus and femur. In addition to these abnormalities, there are,

of course, the trident-shaped hands, bow-legs and knock-knees, pantaloon-shaped pads of fat on the thighs, and the brachycephalic heads.

The pathology, besides the gross bending of the long bones, consists of an aplasia of chondrium. There seems to be no diminution of bone production, but a definite decrease in the amount of cartilage. As a result, the ends of long bones have rather a cup-shaped appearance. The periostium around the epiphysis is contained in the bony collar much as a ball in the hand. The cortex is thickened on the concave side of the bowing.

Treatment consists of correcting the bow-legs and knock-knees by the same methods to be described in infantile rickets. The kyphos in the spine can be reduced by recumbency on a Bradford frame or better in a hyperextended posterior plaster shell. However, there will always be a tendency in the child to be round-backed. Of course, there is, as yet, no cure for the disease, as the changes take place early in fetal life, and the orthopaedist is most interested in the prognosis. Cases of this type are brought suffering with stunted growth, and it is important that parents be warned that the children must not be expected to gain normal height.

Infantile Rickets. We shall pass immediately to the consideration of the pathology, deformities and treatment of this disease. In the osseous system there is a local or general disturbance of the normal process of ossification, as a result of which the epiphyses become enlarged and the affected bones become soft and plastic; growth is delayed and deformities of a serious nature may arise. Rhachitic bone, on section, shows a thickening of the periostium which has become adherent. The medullary canal is enlarged and the contents have become very vascular. The epiphyseal cartilage is much increased in thickness. Microscopic examination here shows marked irregularity of size and shape of the columns of cartilage cells. The zone of calcification is lacking. As a direct result of these changes the epiphyseal junctions are enlarged and the shafts of the bone are thickened by the formation of osteoid tissue under the periostium. Following this stage of weakness, a stage comes in which the bones become abnormally hard, and it may be the premature solidification at the epiphyseal juncture that causes in part the dwarfing of the stature observed as one of the final results of severe rickets. As a result of all of this, while rickets is not a surgical disease the correction of deformities following it demand surgical treatment.

The general deformities produced by infantile rickets are due to the effects of atmospheric pressure, the force of gravity, habitual postures, muscular action and injury. However, very early in the disease, the epiphyseal junctions become enlarged, and the enlargement at the juncture of the ribs and the costal cartilages produces the well known rhachitic rosary. Also thickening of the skull produces the peculiar rectangular shape, caput quadratum; while the softening results in cranio tabes. The pigeon breast, pot-belly and Harrison's groove are due to atmospheric pressure and habitual posture; while the force of gravity, habitual posture and muscular action are responsible for the rhachitic kyphosis and scoliosis, cubitus varus and valgus, coxa vara and valgus, genuvarum and valgum, the misshapen pelvis, and the rotation deformities of the lower extremities. All of the deformities correct themselves entirely or to a great extent except the rhachitic scoliosis, genu varus and valgus, the misshapen pelvis and the rotation of the lower extremities. Stunting of growth is a constant effect of severe and prolonged rickets.

As yet we cannot, to a great extent, control the shape of the pelvis; and scoliosis following severe rickets is almost as harassing, for almost invariably it increases with growth. The problem then stares us in the face of keeping these children under treatment or supervision for the many years required to obtain their growth.

If little deformity has occurred, we may prevent it by a proper fitting corset or light brace, after the acuteness of the disease is past, keeping the patient recumbent on a Bradford frame during this stage if necessary. If marked deformity is present, then we have a serious problem before us. The child's spine may be straightened with corrective plaster jackets applied in the manner best adapted to the individual case. After that, the position may be retained with removable plaster jackets, leather jackets or back braces until growth ceases. It may be that the curvature cannot be corrected at all, and the best

that can be hoped for is that it be prevented from getting worse—or much worse. Of course, a constant routine of graduated exercise must be observed. At any rate, unless gotten early and treated conscientiously and continuously, these cases of scolosis are depressing.

This leaves the treatment of genu varum and valgum—knock-knees and bow-legs—to be dealt with. There are three divisions of this:

1. Expectant. 2. Mechanical. 3. Operative.

Quoting Lovett: "The expectant method of treatment relies upon nature's efforts to repair the deformity; efforts which are aided on the part of the surgeon by keeping the child off of his feet to a greater or less extent, and by constitutional treatment and by massage and corrective manipulation."

The mechanical treatment aims at the gradual correction of the deformity. The brace usually consists of a steel upright, running from the sole to the groin on the inside of the leg for bow-leg, and from the sole to the trochanter on the outside of the leg for knock-knee. There is a joint at the ankle, but no joint is put at the knee, as this reduces the efficiency of the brace. Correction is obtained by a pad at the knee, pulling laterally in knock-knee, and on the outside pulling inward in bow-leg. It seems to be the concensus of opinion among orthopaedic surgeons, however, that mild deformities may be corrected by corrective manipulation; and that deformities too severe for this should undergo operation. Treatment by braces is a long drawn out, offensive affair with too much depending upon the constancy with which they are worn. The operative treatment consists of the simple procedures of osteoclasis and osteotomy. Osteoclasis is possible in selected cases where the deformity is near the middle of the bone, and may be accomplished by the osteoclast or the bone may simply be broken with the hands. The operation of osteotomy, or cutting the bone in two, is too well known to require further description. A few suggestions may be desirable; that an osteotome with long bevels on both sides be used, that blows of the mallet be light, and that the osteotome be moved back and forth after each few blows to prevent binding. The bone should not be cut completely across, rather an attempt to obtain a green-stick fracture be made.

Little or nothing has been done by most orthopaedic surgeons to correct the rotation deformities. Internal rotation of the tibia is bound to produce flat foot in its worst form. A few progressive men, then, are dividing the tibia and fibula and rotating the distal fragments outward. This is especially being done in which an operation is already necessary on the feet. The results so far have been most gratifying.

Adolescent Rickets. It is practically accepted now that rickets may originate at puberty, although the contention that such is a recrudescence is not without reason. A review of the literature seems to indicate that the etiology of adolescent rickets is purely a matter of bone metabolism—the pathology concerns itself practically entirely with the gross changes occurring in the parts affected; and the symptoms are deformity mainly, with some pain and weakness. Patients notice a decrease in their height, and girls especially complain of an increasing inability to wear short skirts. The diagnosis is easy with good X-rays. Osteomalacia and osteitis fibrosa occur at a later age and are more generalized. Treatment is operative in that only rarely a case reports before marked deformity has occurred.

Conclusion.

In conclusion, we would like to raise the question of preventive orthopaedics in the deficiency diseases. We all seem to think that we have performed our duties if the general condition is cured and very gross deformities are corrected. However, never could we so mislead ourselves. Lowman says that knock-knees, bow-legs, torsion deformities, flat-feet, pronated ankles, short legs and faulty spinal alignment produce joint conditions, due to improper weight-bearing with or without arthritis, periarthritis, periostitis, neuritis, etc., that make up a large part of our daily work. The examination of men for military service certainly showed this. The orthopaedic examination of several hundred Boy Scouts, and the daily examination of school children by the writers, show that at least one child out of every four needs supervision and treatment for a deformity following a deficiency disease—mainly rickets. They would like then to

make a plea for the routine orthopaedic examination of all school children. In this way these deformities may be sought out, and corrected and, what is more important, by proper supervision of physicial exercise, games, posture, etc., such deformities may be prevented. The correction of cripples is spectacular and appeals to a few, but let us not discard a remedy that every other department of medicine is using to such good advantage—prevention.

15 *East Franklin Street.*

NEUROLOGICAL ASPECTS OF NUTRITIONAL DISEASES.*

By FRANK H. REDWOOD, M. D., Norfolk, Va.

The information gathered from the English literature on the nervous manifestations of the deficiency diseases is rather limited, with the exception of Pellagra, on which a great deal has been written by American authors.

There are two conditions which we agree are caused by certain food deficiencies, in which there are no nervous symptoms, and therefore will simply be mentioned. I refer to Xerophthalmia and Keratomalacia.

Pellagra is probably of more interest to the neurologist than any other deficiency disease. It was first recognized in Italy early in the seventeenth century, and in France the first of the eighteenth century. Probably the first paper on Pellagra appearing in English was one by an Englishman published in 1817 and reproduced in this country the following year. The disease had not been recognized in this country in any great numbers until 1907, although a few sporadic cases had been reported from different states about 40 years before this time. Until 1911 most of the cases had been reported from institutions, chiefly insane asylums. Tucker[1], however, in the early part of 1911 reported 55 cases occurring outside of institutions, and added 11 to them the same year. All are familiar with the tremendous amount of work done by Goldberger of the Public Health Service, and others. These authors have practically shown that Pellagra is a food deficiency disease, though there are others who claim that foci of infection enter into the etiology. In my own quite limited experience with this disease I do not think I have ever seen a case that did not have a mouth infection in a greater or lesser degree.

Text books of pathology do not deal with Pellagra to any great extent. I am unable to find anything on peripheral nerve pathology. It is believed by some that Pellagra does not produce a definite systemic disease of the central nervous system. Spiller[2] thinks the cell degeneration is caused by some toxic or infectious substance affecting all parts of the cerebrospinal axis, producing cellular degeneration as well as degeneration of nerve fibers in the posterior and anterolateral columns. Tucker, quoting Lavinder, says the pathology is neither consistent nor characteristic. Degenerative changes have been noted in the chromophilic cells of the cortex of the cerebrum and in the cells of the cerebellum, which may be the cause of the ataxia found in some cases. The skin manifestations are thought by some to be trophic in character. The neuro-pathological picture may be said to consist of degenerations, irritations and hyperaemias localized particularly in the spinal cord and its coverings, and in the brain.

If the skin lesions of Pellagra are trophic they do not correspond to the peripheral nerve distribution. They do, however, correspond to cutaneous areas of distribution of some of the posterior nerve-roots. The deep reflexes may be unequal, absent, sluggish, or equally exaggerated. Hemiplegias and monoplegias do occur but are infrequent. Pathological reflexes are not found. Romberg occurs in about one-half the cases and ataxia is frequently present, especially in the severe types of the disease. The senses of smell, hearing and taste are frequently affected, and in a certain number of cases touch sensation is altered. In some patients there is cutaneous anesthesia over the affected part. Restlessness, insomnia and vertigo have been almost constant symptoms in cases that I have seen. There are many mild types that show only restlessness, vertigo, insomnia, etc., without the more definite organic nervous changes.

The mental symptoms of Pellagra do not correspond to any known mental disease. Some cases resemble acute mania without the rapid flow of ideas, and without the homicidal tendencies seen in a maniac. Others resemble the depressed phase of manic depressive insanity without the agitation and the idea of

*Read as part of the symposium on "Nutritional (Deficiency) Diseases" at the fifty-third annual meeting of the Medical Society of Virginia in Norfolk, October 31-November 3, 1922.

having committed the unpardonable sin. In the severer types of cases there is frequently marked mental deterioration. A large percentage of cases are emotionally upset, either irritable, with frequent outbursts of temper, or have frequent crying attacks. Many patients are depressed, and in this state they are suicidal. The delusions are changeable and are usually of persecution. The hallucinations are those of hearing and sight. Apprehension, and a sense of impending danger, are fairly constant mental symptoms. In asylums the study of the mental phases of Pellagra has often been unsatisfactory, due to the disease attacking a patient already insane.

Davenport[3], in studying Pellagra from an hereditary standpoint, concludes that there is no evidence of direct heredity. There may be, he says, an hereditary disposition to the disease, in those families in which chronic gastro-intestinal symptoms have existed for several generations.

A disease closely akin to Pellagra and probably due to an unbalanced diet is Acrodynia. I have never heard of a case occurring in this section of the country. Byfield[4] studied the effect of food on seventeen cases and concludes that the benefit of adequate food was unmistakable, although cure was not brought about quickly in the well-advanced cases. From his studies he says that Acrodynia is a primary nervous disease with a preponderance of sensory manifestations and a mild affection of motor nerves. Brown, Courtney and Maclachlan[5] in their study of eight cases conclude that food deficiency is not an adequate explanation of the disease, and that it is a chronic toxic infection following, or coincident with, some respiratory infection bringing about the metabolic and clinical changes.

The disease is characterized chiefly by paresthesia of the feet and hands, which is a most distressing symptom. A diminution of pain sense has been noticed but this is not a constant sign. Falling out of the hair and changes in the nails are fairly constant findings. The deep reflexes are usually sluggish or absent, but occasionally may be increased. Photophobia is almost a constant symptom and causes the patients to bury their heads in the pillow or to protect their eyes in some other way. Most of the patients are dull and apathetic, although in one of Byfield's cases delirium was noted. Falling out of the teeth with either slight or no involvement of the gums seems to be a frequent symptom. There is no adherent exudate on the lost teeth. This condition suggests an involvement of the fifth nerve. In some cases there seems to be a vasomotor disturbance, as manifested by blueness of the fingers and toes. With the exception of an occasional trace of globulin the spinal fluid has been normal in all cases reported.

Beriberi at one time was thought to be a tropical disease but in recent times it has been found in Labrador and Newfoundland. It is now generally conceded that beriberi is due to lack of a specific substance in food designated as anti-beriberi vitamin, or water-soluble B. This disease may occur in any part of the world if man restricts his diet to certain articles of food. McCollum[7] describes an outbreak in 1914 at the jail in Elizabeth, N. J. Beriberi is a type of peripheral neuritis affecting both motor and sensory nerves. H. Wright[6] found changes in the cells of the posterior root ganglia and in the anterior horns of the cord in eight consecutive cases occurring in his practice. The antero-external leg muscles seem to be particularly affected, producing a characteristic gait. The phrenic and pneumogastric nerves are affected early, and this is usually the cause of early death. The sensory changes are anesthesias and severe pains in the limbs. The deep reflexes are lost early. All degrees of severity are seen, from simple weakening of the extremities to an acute pernicious form that terminates fatally in a few days. According to Mccollum[7] there are two distinct forms, the wet and the dry. Anesthesia, wasting and paralysis are the chief symptoms of the dry type, while the important manifestation of the wet type is edema, which affects the trunk, limbs and extremities. In both forms there is tenderness of the calf muscles and a tingling or burning sensation in the feet, legs and arms. Mental disturbances not unlike those seen in alcoholic polyneuritis are occasionally observed.

Beriberi in this section of the country does not present an economic problem, as cases are rarely found.

The remainder of the diseases commonly considered to be due to certain food deficiencies are of particular interest to the pediatrician. These are, rickets with the usual association

of tetany and spasmophilia, and scurvy.

Scurvy is a deficiency disease due to the prolonged use of a diet lacking in the essential vitamin designated as vitamin C. This vitamin is found in large amounts in the citrus fruits. The chief nervous symptoms of scurvy are restlessness, pain and insomnia. In some cases a diagnosis of paralysis is made on account of extreme pain on motion and epiphyseal separation. Scurvy and rickets occur simultaneously in nearly one-half the cases, and at autopsy rickets is almost invariably found associated with scurvy. Holt[8] says, however, there is no reason to believe that scurvy and rickets are different forms of the same disease.

The most constant early nervous symptoms of rickets are sweating of the head and restlessness at night, the children tossing about in bed and never having the quiet sleep of healthy children. If these patients are not properly treated in the early stage, they will, in a very large percentage of cases, develop tetany and spasmophilia, one of the most characteristic symptoms of which is cardo-pedal spasm. This is not the most common symptom, however, as it is seen in a relatively small per cent. of cases. A typical case of tetany presents flexed fingers at the metacarpo-phalangeal joints and external phalanges; the thumbs are adducted; the wrist is flexed and the hand drawn somewhat to the ulnar side. In some cases of marked severity the wrist is motionless. The feet are extended; the first row of phalanges of the toes are flexed; the second and third rows are extended; the arch is increased. Pain is present and sometimes acute. The cardo-pedal spasm may last a few hours or days but the muscular contraction is usually continuous. In many cases the muscular contraction involves the muscles of the larynx, producing a crowing sound on inspiration, and when this is severe it may lead to loss of consciousness or convulsions. Occasionally, attacks of severe laryngismus stridulous prove fatal.

There are four signs that should be sought for when tetany is suspected, viz: Chvostek's, Trousseau's and Erb's signs and the peroneal reflex. Erb's sign is presumptive evidence of tetany but is not conclusive.

It must be borne in mind that several of the diseases due to food deficiency may occur at the same time. This is particularly true of those diseases that are more common in infancy and childhood.

310 *Taylor Building.*

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CUTANEOUS ASPECTS OF NUTRITIONAL DISEASES.*

By THOMAS W. MURRELL, M. D., Richmond, Va.

This phase of the subject will be dealt with briefly. There are three undisputed nutritional diseases, Beriberi, Xerophtholmia and Scurvy, with two that are debatable, Pellagra and Rickets. There are no distinctive cutaneous manifestations in Beriberi or Xerophtholmia and the same may be said of Rickets.

Brunet (*British Journal of Children's Diseases*) does think there is more sweating than normal with Rickets and a circulatory disturbance appearing in sensitive skin, which shows a red line, when a point, like a fingernail is drawn across it. This, however, is a part of many conditions due to intestinal intoxication.

In Scurvy, there are the distinct symptoms of the haemorrhagic type. On the skin they appear as bruises over the joints and sometimes around the eyes, giving rise to the idea of trauma. On the mucous membranes they may occur as blood-filled vesicles or bleeding excoriations, particularly in the buccal cavity and on the gums. The entire skin is dry and harsh and on the lower extremities follicular hyperkeratosis may take place. Wiltshire (*Lancet* 1919) reported this symptom as occurring in 55% of the three thousand cases of Scurvy occurring in the Servian army.

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Pellagra has a distinct syndrome affecting the skin. It occurs as a dermatitis, affecting the dorsal surface of the hands and extending up on the arms, the exposed surfaces of the face, and the back of the neck, the familiar pellagrin collar. The intensity varies from a pigmentation such as would occur from a slight sun-burn all the way to an intense condition, with the formation of bullae, which rupture leaving weeping surfaces. Any and all stages of this eruption have the appearance of that due to heat, which in the days before its recognition in this country, gave rise to the belief, in institutional cases, it was due to burns by careless nursing. Its most common site is the back of the hands and here it takes on the gauntlet appearance, the pigmentation being marked at the upper border where the limitation from the normal skin is clear cut. From its only occurring on the sites exposed to light, it is generally accepted that actinic light determines the sites of the eruption by its effect on a sensitized skin.

If vitamine deficiency is the cause of Pellagra, it is strange that light should cause this here and yet be one of the greatest aids in the treatment of Rickets. The vitamines are practically the same in the foods supposedly lacking in both conditions. Personal observation would lead to the assumption, there is no relationship between the severity of skin symptoms and the other phases of Pellagra. As in syphilis, the most acute skin conditions may be present in a practically non-toxic case.

The greatest example of nutritional lack in modern times is the German nation in the World War. There is no account of any epidemics of Pellagra though Galeusky (*Urologic and Cutaneous Review*) quotes Riel as describing an epidemic in 1917 of a black discoloration of the skin. This occurred over the face, in the axillary and mammal folds and was not inflammatory. It was made much worse by X-ray and seemed to be increased by sunlight. This disappeared when food conditions became easier and was believed to be due to the absence of wheat in the diet. The most striking thing in this article was the report of epidemics of pyogenic and parasitic conditions which occurred as a part of the general nutritional lack.

This brings out the thought which was emphasized by a food chemist of a packing concern, in a personal conversation a short while ago. He states that hogs which are fattened on swill, put on large amounts of fat, but at the same time waste in muscle. When at their fattest, they develop ulcers of apparently pyogenic nature, but which resist all antisepsis. These ulcers heal readily when the food of the animal is changed.

It would seem, therefore, if there are a few conditions recognized as due to nutritional deficiency, there must be a host of conditions which arise because of a half-way deficiency. It further suggests the reason for protein starvation being the fundamental cause of Pellagra, even if an infective organism is the exciting cause of this disease.

It certainly demands a closer inspection of the dietary in conditions heretofore considered entirely local and only needing local medication.

17 *East Grace Street.*

Discussion.

Dr. W. A. Plecker, Richmond: The work that has been done in recent years by Dr. Goldberger, Dr. McCollum and some other research workers in nutrition is, in my mind, of great importance to all health workers and physicians. We have had in Virginia a reduction in deaths from pellagra from 332 in 1915 to 115 for last year; only about one-third as many. If that is due to any other cause than the dissemination of information which Dr. Goldberger has given out, I do not know what it is.

Another interesting point that Dr. Goldberger brings out is the recent discovery by Dr. McCollum of his fourth vitamin. I had not heard of this and doubt whether it will influence very greatly the actual feeding or not, but it is of interest.

Dr. Goldberger emphasizes the important point that Dr. McCollum has brought out of the use of green vegetables and milk in order to supply the calcium which is needed in bone and tooth formation. I believe that we are coming to the time when the study of bacteria as a cause of disease has almost reached its limit, and we are entering now into a new era of medicine when questions of nutrition come first and must be considered one of the great preventive measures. I believe that a great work can be accomplished in the matter of prenatal feeding. That point is clearly brought out by Dr. McCollum who, by feeding small animals, rats, determined just what would be the physical condition of the descendants of those rats when the diet showed certain deficiencies, and determined with almost absolute accuracy how long the descendants of those rats would live. I could not see that there was a great deal of positive prenatal work in evidence by those doing it, until Dr. McCollum brought out this great question of the prenatal feeding which he narrows down to the influence of feeding the prospective mothers plenty of milk along with leafy vegetables, so as to supply the bone and tooth material that are needed in the composition of the skeleton of the child. If we can just get these points over to the prospective mothers of Virginia and to the country at large, I believe that there is an opportunity of not only improving the individuals who are to be born in the future, but of actually improving the condition of the whole race. I think this question

of nutrition which has been so ably presented to us here is one of supreme importance, and I hope that the men who have heard it will carry out the measures suggested.

I want to suggest one thing, that Dr. Royster included in his paper,—those little remarks which he made on the side with reference to the importance of avoiding condensed milk and dry milk. I think that is one of the most important points that he brought out. Another point, in connection with the use of orange juice, I would like to call attention to the fact that tomato juice is equally as good and can be secured everywhere.

DR. CHAS M. HAZEN, Richmond: This broad subject deserves the able treatment which it has received in this symposium. It defies exact definition and limitation, but practically our attention is fixed on the result of the disturbances of nutrition upon cell function and regeneration, causing lowered muscular, circulatory and nerve tone, with diminished resistance to disease.

McCarrison's classical article (*Indian Journal of Medical Research*, abstracted in *Journal of American Med. Ass'n*, Vol. 74, No. 12, Mch. 20, 1920) uses the expression "nuclear starvation" of cells of all kinds; he is referring particularly to the lack of vitamin-water-soluble B, incorrectly limited by the term "anti-neuritic," since all tissues suffer degenerative changes, the symptom-complex being due to chronic inanition, alimentary derangement, disordered endocrines, as well as malnutrition of the nervous system.

McCarrison lists the various organs, the adrenals being hypertrophied, others atrophied in various degrees of severity after the following order: Thymus, testicles, spleen, ovaries, pancreas, heart, liver, kidneys, stomach, thyroid, brain; the red cells are diminished. (Pituitary in experimental male pigeons shows tendency to enlarge.)

Naturally this is but one phase of a great subject, as extensive as the range of physiological chemistry. From the discussion of one vitamin, water-soluble B, we turn to A and C, the anti-rachitic and anti-scorbutic respectively, and the recently discovered vitamin D; then to food factors in general, mineral salts, proteids and their constituent amino-acids, fats, carbohydrates, and a consideration of their metabolism and products.

This leads to a discussion of endocrinology, on the broad basis of the hormonic inter-relation of all the tissues.

We are brought towards the explanation of certain mysteries such as diabetes, psoriasis and leukoplakia; we contemplate the phenomena of anaphylaxis—for example, "alimentary anaphylaxis," from pancreatic insufficiency, in which egg-albumin although digested by pepsin produces in sensitized animals diarrhoea and rash.

We notice the poorly understood metabolic influence of diseased tonsils and adenoids, of heteroplastic grafts, of malignant growths—these are not to be explained by such simple postulates as those of Koch. We turn to physiological conditions and effects on function and development, pre-natal and post-natal, from exposure to heat and cold, to electricity, to cold light, to the ultra-violet ray, to exercise. Animal experimentation is being diligently pursued along all these lines. We may instance the effect of the mercury lamp in producing monster forms in molluscs (Poynter, abstracted *Anatomical Record*, Jan. 20, 1922), the effect of various agencies on the oestrus cycle of the albino and Norway rat.

Here we begin to see the light down the vista of heredity and meet such abnormalities as mongolism, (transmitted by male) achondroplasia. We even find the laboratories influencing by artificial means the transmission of chosen dominant or recessive qualities, Danforth reports (abstract *Anat. Record*, May 20, 1919) brachydactyly, polydactyly, color and shape of comb as being handed down in different proportions by cocks before and after treatment by alcohol.

Our subject thus partakes of the widest character throughout the field of physiology and pathology and is interested in all descriptions of natural and artificial influences, such as drugs, the leucocytic reaction to morphine, the specificity of arsenic and antimony, the effect on life and death of food, exercise, heat, light electricity, violet rays, X-rays and radium.

This leads me to refer to the relation to deficiency disease of the last two agents, X-ray and radium; a productive relation, as in animal experiments they are used to influence growth and development; a therapeutic relation, to control hypertrophy and excessive function in thymus and thyroid. They are known to produce deleterious effects upon the operator, indicated by leucopenia, eosinophilia, general asthenia.

I would indeed protest against the indiscriminate use of these powerful agents and feel that professional enthusiasm frequently goes too far, with uncertain and dangerous results to the patient.

DR. W. H. RIBBLE, Wytheville: I recently saw a child, eight months old, with a very severe case of eczema of the scalp and face. It was brought out that the child's exclusive diet had been condensed milk. On withdrawal of this and adjustment of the food, there was immediate improvement.

I find, so often, that children with digestive trouble are given condensed milk because it appears to agree with them better than other artificial foods. And, because the child appears to keep well and thrive, the mother is "afraid to make a change." She does not, or will not, believe that this apparent correction is on the same principle that starvation corrects indigestion and must not be continued too long.

Thirty-five years of experience makes me hesitate to condemn prepared foods "in toto." There are babies who will thrive on milk mixed with barley, Mellin's food or other prepared foods, who will not do well on milk alone. The admixture prevents the formation of large curds, which makes cow's milk hard to digest.

Again, there are conditions in which milk and broths are not tolerated at all and the child will do well on barley water or some prepared food, until that condition is overcome.

DR. R. BRUCE JAMES, Danville: In regard to Pellagra: from what I have seen of it and heard others say, and from what has been written on the subject, I am almost persuaded there are two different diseases called Pellagra. One is caused by improper food and can be cured by proper diet. The other disease has no relation to food, but is curable by drugs, chiefly the arsenic preparations—without change of diet. This is the only kind of Pellagra I have seen.

Now in regard to malted milk and condensed milk; although they are not complete foods, and often produce scurvy, I have seen children who have grown up and had nothing but malted milk who seem perfectly normal in every way, and yet these children show abnormality as to general nervous system later in life. Physically, they are all right as children, but in after life nervous symptoms develop.

There is not enough attention paid to feeding our school children; we have gone off at a tangent in the matter of athletics in our schools; we take a poorly developed and poorly nourished child and attempt to make an athlete of him, without looking after his food supply at home. People in this country for the most part have sufficient food for their children, but are

woefully ignorant as to its preparation for consumption by the growing child.

Feed a child properly from infancy and you will not need a teacher to make him run, play and develop him physically. Bring him up on poor food and he will have a poor physique with all our craze for athletics.

Food values and the preparation of food should be taught every child and dietetics should be compulsory and taught in the Grammar School,—boys as well as girls should be taught these things. We wait until they enter High School, where only a small percentage of the children go, then we allow the child to decide for himself whether he will take Dietetics or not. This is all wrong and will be corrected as we grow wiser.

DR. C. F. RINKER, Upperville: I would like to ask the gentleman who just sat down whether he is certain that those children were fed on malted milk alone. In my experience they say they were fed on malted milk, but when you inquire closely you find there was something added to the malted milk, and the amount of milk that was added was all the nourishment the child required. These are placebos, in my opinion, and are not of any nutritious value. It has been a mystery to me why medical men try to improve upon the work of the Creator. He put milk in the mother's breast. If he had wanted malted milk or Mellin's food, he would certainly have placed it there.

I live in a rather rural district and have a good many children among the poorer classes of people. I am frequently called to homes where they have given the child all sorts of rich gravies, etc. The trouble is to get correct food, and I find it is very easy to give them a preparation of malted milk or Mellin's food and tell them to go according to directions. But I do not do that. I go into the home and prepare that milk myself and I show the people how it must be done. I see that the milk is boiled as I would have it boiled, and I use boiled milk exclusively. I have every reason to believe that boiling does not interfere with the nutritious value in any shape or form.

I wish I had with me a picture of a little child I took hold of some years ago, when she was about one week old. She only weighed about one and one-half pounds. I fed that child on one-twentieth milk, one part milk to twenty of water. The mother asked me why I did not give it water altogether. I explained that we would simply have to find out how much the child could take and digest in order to be on safe ground and be able to save the child. Of course you will understand that I gradually increased the milk from time to time until I found how much the child could digest. It is easy to go too far, which can be detected by watching the stools every day. As soon as curds appear, you will know that you have gone too far and must at once cut down the amount. We got along very well with it up to a certain period, when the mother became anxious and increased the amount of milk too rapidly and the baby lost everything gained, but I had her go back and start over again and come up gradually, which she did. The child began to increase in weight and is today equal to any child of the age I know.

I want to tell you of a case of impetigo. This mother has given birth to six children. The first four were not under my care and were fed on Mellin's food and malted milk and the different preparations. All of these children died at about four months of age. With the fifth child I had the mother during her gestation and I tried my best to get her to take milk, and finally succeeded. She had been told that her milk was poison to her children, and after her confinement she said she could not nurse the child. But finally, I convinced her and that child is a good looking specimen today. The other child, at the age of two months, developed impetigo, and I feel sure that the mother's diet during gestation had something to do with it.

Since the above remarks were made, the child with impetigo has died, having been treated by three general practitioners and two specialists. In my humble judgment, it is a dangerous thing to give much medicines to little babies, for fear of upsetting their digestion and lowering their resistance.

DR. JOSEPH GOLDBERGER, Washington, D. C.: There are one or two things that I should like to say besides attempting to answer one or two of the questions that have been asked.

I should like to emphasize as perhaps more important than the frank, outspoken entities that are recognized as scurvy, beriberi, etc., the latent or larval forms of these conditions. Very little thought will lead one to realize that there must be an almost infinite series of stages between optimal nutrition and nutrition so faulty as to manifest itself as some frank form of pathological condition. It must be manifest, too, that the symptoms, if any, of these minor deviations may be expected to be so mild or slight, so lacking in distinctive characters, as to make it impossible to identify their origin. In other words, it is readily conceivable that we may have all degrees of ill health dependent on varying degrees and combinations of faults in diet, some of which, perhaps a very large proportion of all, may be difficult or impossible to identify clinically. It is, therefore, a good, sound, practical principle for the clinician at all times, but particularly when dealing with vague, ill-defined types of ill health, to consider the possibility that these may be dependent on faulty diet and to advise his patient accordingly. All this leads us again to emphasize the basic importance of a proper diet and normal nutrition.

Now as to some of the questions that have been asked: I agree with the statement of one of the speakers that there is no necessary correlation between the extent of the eruption and the severity of an attack of pellagra. It is much less certain, however, than the same speaker seems to believe that there is any real correlation between the pellagrous eruption and sunlight. With respect to the question of the cause of the reduction of pellagra mortality in Virginia, my judgment is that the economic factor is principally to be credited with it. Improvement in food supply has resulted in less sickness from pellagra and so in fewer deaths. In a smaller measure it is due to the more intelligent and more effective treatment given to the sick.

DR. L. T. ROYSTER, Norfolk: About three-fourths of my professional work is among malnourished children and I naturally feel quite keenly on that side of the question. My belief is this. Whatever may be the underlying factors of malnutrition, infections of the tonsils, infections of the teeth, or anything you choose to mention, we must know in order to handle these cases intelligently, two or three fundamentals. We must know, as far as science has taught us up to the present moment, what takes place chemically in the digestive tract from the time the food is ingested to the time the dejecta is expelled. We must know the mixture of food elements in every preparation. We must know as far as science has taught us up to date, the relation of metabolism to these food elements. You can not treat malnutrition on any other basis than intelligently. In fact, everybody who has the interest of mankind at heart, and I am quite sure physicians have, should train themselves in these fundamentals and apply the principles learned in the handling of nutrition cases, remembering always that you can not measure the amount of vitamin. It is a very hazy sort of thing at

present. We know that it is contained in a certain food product; you cannot measure this, that or the other in every single potato, or apple, or kernel of corn, or anything like that, but you should know the approximate proportion of each of the essential elements in the available food. Therefore, give that matter thought from the time the mother knows she is pregnant until the time the child passes into the adult, remembering, if you please, that pediatrics has to deal with two important factors, one which has been too long emphasized, the care of the individual in acute conditions, which is important as far as life and death is concerned. But also remember that the baby of six months or the child of five years in the course of twenty or thirty years is going to be a governor or legislator, and what is vastly more important, the mother or father of the next generation. Pediatrics has to deal with the adult as seen in the child. That is the viewpoint of the child that I wish to bring to you on this occasion.

Dr. Thos. Wheeldon, Richmond: I am sure that you men are overlooking the orthopedic situation,—the fact that 25% of the school children have weight-bearing defects due to deficiency disease. After you cure the child's rickets, his scurvy or other things, are you going to leave him, deformed? If you do, when these children become adults you are going to fill the orthopedic surgeons' offices with cases that could easily have been prevented. Extensive experience in the public schools of Richmond has convinced me that this is being overlooked entirely.

CERTAIN ASPECTS OF MEDICAL EDUCATION.*

By THEODORE HOUGH, University, Va.
Dean, Department of Medicine, University of Virginia.

I have purposely chosen for the title of this paper one which does not narrowly confine me as to subject matter. Medical schools are continually criticized by physicians and by the general public for a number of things they do and it seemed worth while for some one who is actually engaged in the work of class room instruction and in the administration of the internal affairs of a medical school but who nevertheless hopes that he pursues this vocation with single reference to the function of the medical school in the organism of society, to discuss some of these criticisms.

Education and Licensure of the General Practitioner and of the Specialist.

The primary function of the four-year course in medicine is to train safe general practitioners of medicine. It is not the function of this school to train specialists. Specialization should always be built upon the foundation of training for general practice and the time is coming when it will no more be possible for a physician to engage in the practice of a specialty without adequate training therefor than it is for one to engage in the practice of medicine without a license from a State Examining Board. Specialists are needed; but where we need one specialist, we need ten general practitioners. Both to maintain the proper relative proportions of specialists and general practitioners and equally to insure proper training for the practice of a specialty it is of the highest importance that it be made impossible for a physician to *license himself* as a surgeon, a gynecologist, or an oto-laryngologist.

Some legal authority must be established to license specialists. The State Boards of Medical Licensure, reasonably well adapted to license general practitioners, are hardly fitted for this work. I would offer the suggestion that this is a service which the National Board of Medical Examiners may well assume,—this Board conducting the examinations, both theoretical and practical, and the State Boards issuing the license only to holders of the certificates of the National Board.

The foregoing remarks touch upon a frequent criticism of the modern medical school—that it is training specialists and not general practitioners. This is true in a very limited sense and only in a few medical schools. A distinct and in my opinion a permanent reaction has set in against the practice of some medical schools of making the fourth year of the curriculum consist almost entirely of electives, thus encouraging specialization in the four-year course. The remedy for the abuse of specialization lies in proper legislative enactments and not in any change of curriculum or of purpose in the medical school.

The Effect of the Elevation of Standards of Medical Training Upon the Output of Physicians.

Granting then that the medical school is really training and will continue to train general practitioners (a small percentage of whom will spend three or four additional years in preparation for the practice of a specialty), I proceed to the next proposition which I desire to advance—namely that *every man graduated from a medical school should be trained to bring to his patient the very best of diagnosis and treatment possible for a general practitioner in the existing state of the science and art of medicine.* The charge is repeatedly made that medical schools have so advanced their standards of admission and graduation,

*Read at the fifty-third annual meeting of the Medical Society of Virginia in Norfolk, October 31-November 3, 1922.

have so increased the time and expense of training that the number entering upon the study is too greatly reduced; "the poor boy, and especially the country boy, is thereby virtually excluded from medicine as a profession; the city with its allurements absorbs the corporal's guard whom the medical schools graduate, and none are left to care for our rural population." We continually hear the cry "Give us doctors; well trained doctors if possible; but in any case doctors and plenty of them." Let us examine the facts.

The graph in Figure 1 gives you the exact statistics of what has happened. The peak came in 1901 since which time there was a steady decline until the more rapid fall in 1918,—obviously due to the universal requirement of one premedical college year in all schools in 1914. Many schools did not wait until 1914 to put the advanced requirements into effect and part of the gradual decline from 1905 to 1913 inclusive is due to the adoption of the one or even the two-year pre-medical requirement by one school after another during that period.

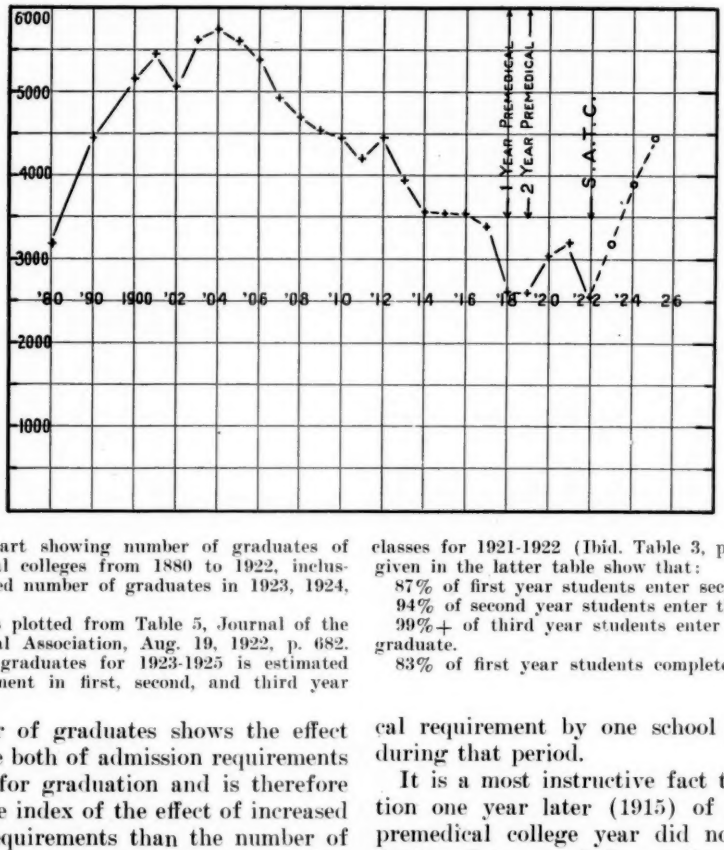

Figure 1. Chart showing number of graduates of American medical colleges from 1880 to 1922, inclusive, and estimated number of graduates in 1923, 1924, and 1925.

The graph was plotted from Table 5, Journal of the American Medical Association, Aug. 19, 1922, p. 682. The number of graduates for 1923-1925 is estimated from the enrollment in first, second, and third year classes for 1921-1922 (Ibid. Table 3, p. 636). Figures given in the latter table show that:

87% of first year students enter second year.
94% of second year students enter third year.
99%+ of third year students enter fourth year and graduate.
83% of first year students complete medical course.

The number of graduates shows the effect of the advance both of admission requirements and of those for graduation and is therefore a more reliable index of the effect of increased educational requirements than the number of men admitted to our medical schools. The modern improvements in medical education began about 1900 or 1901; the one-year pre-medical college requirement went into general effect in 1914; the two-year pre-medical college year in 1915. Beginning with 1904 or 1905 we should therefore look for the effect of the first improvements (high school graduation for admission and better teaching in the medical course) upon the number of graduates.

It is a most instructive fact that the adoption one year later (1915) of an additional premedical college year did not result in a further decrease of the number graduated in 1919. The man who could or would spend one year in college to prepare himself for the study of medicine was willing to spend two years for the same purpose if necessary. In other words, the student body of our medical schools by that time consisted of men and women who took seriously their responsibility for adequate training for their chosen life work.

After 1919 the number of graduates dis-

tinctly increased for two years until the present year, 1922, when there was a sudden drop. This may seem disturbing until one remembers that the Class of 1922 entered in the Student Army Training Corps year, 1918. Both because some men merely took advantage of this avenue to escape the draft, but more because a larger number were so thoroughly discouraged after one term of that period of educational delirium and withdrew at its close, this class,—somewhat smaller to begin with—showed an exceptionally high percentage of mortality.

That this is the correct explanation of the marked decrease in the number of graduates last June is shown by the number we may reasonably expect to graduate in '23, '24, and '25, estimated from the number of students enrolled in the session 1921-22 in the third, second, and first years respectively. (See Figure 1). It is clear that, with the passing of war conditions, there has been a remarkable increase in the number of men entering upon the study of medicine and in 1925 we may expect to graduate about 4500 men and women well prepared to practice medicine as against 5700 graduated in 1904, more than half of whom were emphatically not fitted to practice medicine. In 1925 we shall graduate 80 per cent of the highest number graduated before the advancement of standards.

We cannot, of course, expect to continue the remarkable rate of increase shown in the graph for 1923-1925. It is partly due to delayed entrance upon professional study of men in the service or who in other ways were drawn away from schools and colleges by war activities and conditions. It was favored by the general prosperity which prevailed into 1921 and the ease with which money could be borrowed. We should rather anticipate a slight decrease in first year enrollment either this session or next,—or at any rate no increase. The figures for the total enrollment for the present session, which are not yet available, are awaited with interest as an indication of what we may expect in the future.

If medical schools maintain, as there is every reason to think they will maintain, this output of physicians, that fact will constitute an object lesson which all engaged in higher education should take to heart. The period of training has been lengthened from four to six years, the expense of the course to the student has greatly increased, the two premedical college years have sifted out most of the incompetents and impossibilities who formerly crowded into the medical course; above all, the course of study has immensely increased in difficulty; yet, despite all this, there will have been by 1925 only a decrease of 20 per cent from the peak year before these educational reforms were begun. We are often too timid about doing the right thing in education because we do not trust the public to recognize and support a good thing. Yet here is perhaps the boldest and most heroic measure for the elevation of educational standards in our educational history put into effect with only a trifling diminution of enrollment. I believe in avoiding undue haste in such matters; but I also believe that if the two-year premedical college standard had been enforced for all Class A schools in 1910, it would have been accomplished with no greater loss of students and without any more trouble than that with which it was actually accomplished in 1915.

The Problem of Rural Practice.

It is not altogether inappropriate to discuss briefly in a paper entitled "Certain Aspects of Medical Education," a very real and serious condition for which medical schools are unjustly held responsible; namely, the supply of physicians to rural districts. There can be no doubt that rural Virginia is inadequately supplied with medical service and there can equally be no doubt that an adequate rural medical service is indispensable to the economic life of this state; but neither the medical school nor legislative enactment can force medical graduates to go into rural practice.

The need of an adequate rural medical service is obvious; all desire to meet this need. The extensive discussions of the subject in Virginia during recent years, however, reveal wide differences of opinion both among the laity and among physicians as to how this need can be effectively met.

The measure most extensively urged is to graduate more physicians,—even more physicians, for example, than in the peak days of inefficiency of medical education in 1900-1904. There will then be an over-supply and some of these men will be forced into rural practice by economic necessity. Incidentally, it

will, on the whole, be the less skilled graduates who will settle in the country. The rural population will have an inferior type of physician.

This proposal coolly sets hard and fast economic laws at defiance. You may be sure that, as soon as this scheme is in operation and medical graduates are forced to go in considerable numbers to the hardships of rural practice as it exists to-day, the overcrowded condition of the profession will soon become common knowledge and the number of men entering the study of medicine will be cut down. You are no longer taking men from the high schools or even without a high school education into the medical school. The profession is now recruited from college students and college students are fairly well informed as to the relative chances of success in the various vocations of life. The plan in question will defeat its own end and may be dismissed from consideration for what it is,—a dream pure and simple, impractical and fantastic.

Nor can we treat with greater seriousness the suggestion made in various forms but always boiling down to the proposal that we have a high grade medical school to train men for city practice and a low grade school to train men for rural practice. Those engaged in medical education have a right to depend upon every physician in practice to combat at all times the idea that the rural general practitioner need not be as good a physician as the general practitioner in our cities. The medical school is not doing its duty unless "every man graduated therefrom is trained to bring to his patient the very best of diagnosis and treatment possible for a general practitioner in the existing state of the science and art of medicine." It makes no difference whatever whether that patient lives in the city or the country; and the medical profession, which is primarily the guardian of the public health, fails in its duty unless it actively promotes this gospel among the people.

Nor do I feel hopeful of the success of the proposition to pay for the education of medical students on condition that these subsidized men will settle in the country for a certain period after graduation. Unless you give the Governor or the State Board of Health or some other governmental agency what none of them will seek, namely, the power and duty to loccate these men where they are most needed—which will usually be the posts of greatest hardship—you will hardly meet the real difficulty; and I know of no law successfully limiting or denying the right of a free American citizen to live where he chooses.

Another proposed remedy fails to solve the real problem although it will contribute something to the final solution. I refer to the extension of rural public health service, including rural district nursing and rural social service. With the cooperation of these agencies one physician can care for a larger rural population and we shall be able to get along with fewer physicians than would otherwise be needed. We would also have a more efficient rural medical service. But neither the health officer, the sanitary inspector, nor the nurse can take the place of the physician and our real trouble arises from the fact that new physicians are not settling in the country. Nor is there any reason why the same factors which make rural medical practice unattractive to our medical graduates would not be equally operative in the case of health officers and nurses.

The Real Difficulty in Supplying Rural Medical Needs.

Most of these futile measures are based on the assumption that we are to continue to have the present inadequate supply of physicians. I have shown that statistics prove that this condition is temporary; that in three years we may expect to graduate four-fifths as many physicians as we ever graduated. *The responsibility of the medical school in the solution of the problem of rural practice ends when it graduates enough men annually to meet the needs of the population*, and the medical schools will be doing this in a very few years.

We may as well be honest about this matter,—honest with ourselves and honest with our rural population. Every physician knows perfectly well that men will not go into rural practice in adequate numbers until, under improved conditions of rural practice, first, they are able to do full justice professionally to their patients; second, until they earn a reasonable livelihood from the practice of their profession; and, third, until the physical hardships of country practice are ameliorated. The first of these conditions involves the estab-

lishment of small local hospitals in which ill patients may be treated when home conditions render proper diagnosis and treatment impossible. The second condition is a question of finance and in places probably involves some scheme of health insurance. The third condition is virtually the issue of good roads in this state of Virginia.

Good Roads the First Sine Qua Non of an Adequate Supply of Rural Physicians.

At first sight it might seem that medical training and good roads are rather unrelated subjects; but Virginians may as well understand that so long as the rural physician must struggle through mud in order to bring to his patients the best he can under the circumstances—but knowing full well that this best falls far short of what he could and would gladly do for them professionally,—so long as these conditions continue, no medical school can deliver its goods to the rural population.

We may as well use plain words in this matter. The closed and especially the closed heated automobile would remove nine-tenths of the difficulties and hardships of rural practice; but this car and mud roads do not go together. In the recent discussions of the Booker-Hurt bill in the Legislature Senator Downing indulged in a glowing eulogy of the old time country doctor of the mud road, the saddle and saddle-bags, and charged Senator Goolrick with indifference to the medical needs of the country people. Senator Goolrick replied that in pressing measures for the construction of a good road system in Virginia, he was working more effectively to bring doctors to the rural population than he could possibly do in any other way. And in that reply Senator Goolrick hit the nail squarely on the head.

Virginians and especially rural Virginians who call for doctors in the country districts at the same time that they oppose a bond issue for a good road system had better take notice of another fact. South of us North Carolina and north of us Maryland and Pennsylvania are not self-bound hand and foot by the "cash and carry" system in providing capital for urgently needed public improvements. They are issuing bonds and are building good roads. Virginia has before her the question of a bond issue for the same purpose. Suppose this proposal is defeated and Virginia gets her good roads in fifty years while her adjacent sister states get theirs in five years. In what states will the medical graduates who are ready to go into rural practice settle? If our rural population wants medical service (and good modern medical service at that) let them get busy with their legislators and put through this bond issue. *They may as well understand that otherwise the rural medical situation will grow worse and no power on earth can make it better.*

The italicized words in the last sentence deserve brief elaboration, for the situation we are facing is not that fewer men are going into rural practice than formerly; not that the number of men settling in the country has decreased by twenty or forty or fifty per cent: but *that virtually none of our present graduates are doing this, and virtually none of them will do it* until the conditions of rural practice are improved. As the heroes of the mud road and the saddle-bags die off, none take their places. It requires no imagination to see that in ten or twenty years there will be almost no rural physicians left.

The modern medical graduate is not mercenary. He generally finishes his course in debt, and in view of this fact he cannot afford to be a missionary at his own expense; he has prepared to render a highly skilled service and he is going to work where he can give this highly skilled service—not an inferior service—to his fellow man. He will not and should not sacrifice his ideals of professional service to impossible Virginia mud. Remove the real trouble—and it can be removed by issuing bonds and building good roads—and I can assure you the problem of rural medicine will be solved.

Discussion.

Dr. J. B. DeShazo, Ridgeway: There is just one suggestion about supplying the rural population with doctors: that is for each district to vote a certain amount, to be a regular salary for a physician to practice in that community, in addition to what he gets from his regular fees. This, I think, is the only way it can be done.

OBSERVATIONS ON DIPHTHERIA IN VIRGINIA.*

By A. H. STRAUS, Richmond, Va.
Director of Laboratory, State Board of Health.

The annual report of the Virginia State Board of Health for 1921 brings out the rather

*Read at fifty-third annual meeting of Medical Society of Virginia, at Norfolk, October 31-November 3, 1922.

interesting fact (Table I) that there has been, during recent years, no steady decrease in the deaths from diphtheria as there has been in many other diseases, as for example, typhoid fever. This is true, in spite of the fact, that diphtheria is one of the best understood of the communicable diseases. The organism causing it is known and can be readily identified; quarantine can be put on a scientific basis instead of a guess-work period of time; we have a curative serum, antitoxin, invaluable for treatment; the harmless operation of intubation for laryngeal cases; the Schick test for determining the susceptibility of individuals; preventive inoculations of toxin-antitoxin mixture, etc. Yet, with all of this knowledge available, more died in 1920 and in 1921 than in 1913.

The big factors that cause some years to be "bad" diphtheria years while others are comparatively "good" are not known. Nevertheless, there is much knowledge available that is not being used. In comparatively few cases are cultures submitted before release from quarantine. Yet we know that this is the only method by which the duration of the infection can be determined. Likewise, diagnostic cultures are frequently not submitted, with the result that many persons, diagnosed as having only a "mild sore throat," are turned loose on the community as carriers of virulent diphtheria bacilli. It is the importance of these factors that we particularly wish to emphasize in this paper.

For me to mention to you physicians the importance of the prompt administration of antitoxin, the value of intubation, and other clinical matters would be presumptions. I shall, therefore, confine myself to the viewpoint of the laboratory and public health worker.

TABLE I.

Year	1913	1914	1915	1916	1917	1918	1919	1920	1921
Number of Deaths in Virginia	302	340	374	316	221	216	278	334	367
Death Rate per 100,000 in Va.	14.2	15.8	17.1	14.2	9.9	9.7	12.1	14.4	15.6
Death Rate per 100,000 in Registration Area	18.9	17.9	15.7	14.5	16.6	13.8	14.7	15.3	

TABLE II.

Showing the Number of Diphtheria Deaths, the Diphtheria Death Rate and the Number of Cultures Examined by Public Health Laboratories in 1921.

County or City	Number of Deaths	Death Rate Per 100,000	Number of Cultures Examined
State Total	367	15.6	15,803
Bristol	5	72.5	1
Buchanan	11	68.2	0
Radford	3	64.0	2
Washington	19	58.8	6
Powhatan	3	45.5	2
Appomattox	4	43.0	0
Tazewell	12	42.4	25
Nottoway	6	42.0	27
Hanover	7	38.2	127
Princess Anne	5	35.4	0
Dickenson	5	35.2	0
King George	2	34.8	1
Rockbridge	7	34.0	3
Russell	9	33.2	18
Franklin	8	32.2	8
Alleghany	5	32.2	47
Scott	8	32.1	0
Montgomery	6	32.0	4
Greene	2	31.4	0
Bath	2	31.2	137
Henry	3	29.2	5
Isle of Wight	4	28.2	6
Danville	6	27.3	1351
Richmond County	2	27.0	8
Roanoke	14	26.6	1055
Roanoke County	6	25.5	63
Grayson	5	25.2	1
Mecklenburg	8	25.2	195
Craig	1	24.2	4
Fluvanna	2	23.3	3
Pulaski	4	23.2	4
Sussex	3	23.2	4
Floyd	3	22.8	6
Wise	11	22.7	4
New Kent	1	22.0	11
King and Queen	2	21.8	1
Dinwiddie	4	21.7	27
Highland	1	20.3	0
Accomac	7	20.0	79
Amelia	2	20.0	76
Loudoun	4	19.5	73
Wythe	4	19.5	308
Halifax	8	19.2	24
Pittsylvania	11	19.2	2
Spotsylvania	2	18.7	5
Bedford	7	18.2	7
Botetourt	3	18.1	6
Patrick	3	17.8	0
Louisa	3	17.5	8
Arlington	3	17.5	*
Giles	2	16.8	1
Warwick	2	16.6	0
Alexandria	3	16.5	97
James City	1	16.3	7
Clifton Forge	1	16.1	6

*Cultures examined by Hygienic Laboratory number not available.

County or City	Number of Deaths	Death Rate Per 100,000	Number of Cultures Examined
Petersburg	5	15.6	844
Nansemond	3	14.7	7
Southampton	4	14.4	25
Chesterfield	3	14.3	64
Augusta	5	14.3	90
Winchester	1	14.2	12
Clarke	1	14.0	4
Prince Edward	2	13.5	10
Smyth	3	13.4	1
Lunenburg	2	12.8	7
Caroline	2	12.6	38
York	1	12.3	62
Essex	1	11.7	104
Lee	3	11.7	0
Greenesville	1	11.6	16
King William	1	11.4	23
Goochland	1	11.3	48
Campbell	3	11.0	18
Surry	1	10.7	3
Madison	1	10.4	1
Lancaster	1	10.3	0
Amherst	2	10.0	5
Rockingham	3	10.0	12
Richmond	17	9.7	6455
Brunswick	2	9.4	2
Northumberland	1	8.6	10
Frederick	1	8.0	4
Culpeper	1	7.5	7
Prince William	1	7.2	5
Page	1	6.7	6
Norfolk County	4	6.4	1
Buckingham	1	6.3	1
Charlotte	1	5.6	1
Portsmouth	3	5.4	437
Carroll	1	4.7	1
Fairfax	1	4.5	211
Elizabeth City	1	3.8	15
Norfolk	4	3.3	2190
Lynchburg	1	3.3	481
Newport News	1	2.6	276
Albemarle	0	0.0	20
Bland	0	0.0	2
Charles City	0	0.0	9
Cumberland	0	0.0	6
Fauquier	0	0.0	14
Gloucester	0	0.0	0
Henrico	0	0.0	152
Mathews	0	0.0	0
Middlesex	0	0.0	4
Suffolk	0	0.0	10
Nelson	0	0.0	2
So. Norfolk	0	0.0	5
Northampton	0	0.0	37
Orange	0	0.0	46
Hopewell	0	0.0	4
Prince George	0	0.0	4
Rappahannock	0	0.0	0
Harrisonburg	0	0.0	16
Shenandoah	0	0.0	33
Stafford	0	0.0	0
Warren	0	0.0	9
Buena Vista	0	0.0	2
Charlottesville	0	0.0	4
Fredericksburg	0	0.0	31
Staunton	0	0.0	41
Westmoreland	0	0.0	0

A careful study of Table II brings out some very interesting facts. If this table is divided at that point, Petersburg, where the death rate is the same as the average of the entire state, we observe:

1st. That localities containing 42% of the population of the state had a death rate higher than the state as a whole.

2nd. That this same 42% furnished 274 or 75% of the diphtheria deaths for the entire state.

3rd. That this portion of the population, though having 75% of the diphtheria deaths, submitted less than 25% of the cultures examined by the various public health laboratories of the State. That is less than half of our population have three-quarters of all our diphtheria deaths and submit less than one-quarter of all cultures.

It is evident, therefore, that those places having the highest diphtheria death rates submit comparatively few cultures for examination. A glance at the top of Table II is sufficient to verify this. Hanover County might appear to be an exception. However, our records prove that it is not, since only 8 of the 127 cultures submitted came from the localities having the 7 deaths. Over 100 cultures came for Ashland and vicinity where there were no diphtheria deaths. That is, this community in the center of a diphtheria outbreak, apparently of considerable proportion, did not lose a case, though deaths occurred on all sides in the county. Of course, I do not mean to imply that the taking of cultures prevented the deaths, but the taking of cultures is apparently associated very closely with the successful handling of diphtheria cases in Virginia.

The question, therefore, before us is, "why do communities leading in diphtheria death rates submit comparatively few cultures?" The answer I had expected to make before I began this study was that such a community was usually remote from a laboratory and the cases difficult to reach, but such an explanation, though kindly, is unfortunately rarely true. Taking the three places at the top of our list we find that two of these are towns and one a mountainous county. Remoteness might explain the high death rate in Buchanan County, but it would hardly explain the situation in the towns of Radford and Bristol. Diphtheria in a town means rapidity of spread due to close communica-

tion, but it also means, or should mean, every facility for the prompt and efficient handling of cases. When a town has a diphtheria death rate of 72.5 and submits 1 culture for examination during the entire year, comment would seem superfluous.

Therefore, since remoteness and difficulties of transportation fail to answer our question we must seek further for an explanation. After studying the situation I believe that the failure to take cultures frequently indicates carelessness in other directions also, and that this carlessness is largely responsible for a high diphtheria death rate.

I often hear physicians say "I have no time to take cultures; in all supicious cases I give antitoxin." This may sound reasonable, but what are the facts? In the first place, he has time to take a culture—two or three minutes at the most. Furthermore, he often fails to report these cases or to quarantine them. In case of quarantine he releases his cases without cultures and, therefore, often while they are still carriers. He fails to pick up mild cases, which later become carriers. The physician who doesn't check up his work and verify his results whenever he can is usually lazy and careless, and he is responsible only too often for laxity in others.

We do not advocate waiting for a swab report before giving antitoxin, but we do urge taking the swab just the same. We know that a negative laboratory report may sometimes be in error, but not very frequently. We furnish laboratory service in diphtheria because we are convinced that it is of great usefulness in controlling the disease and we notice that when a physician once begins to use this service he continues to do so.

If a physician finds that a certain type of throat that he has called "suspicious" and given antitoxin always comes back negative then he has eliminated one source of error.

If on the other hand some of his "slightly suspicious" throats turn out to be diphtheria he has certainly gained in knowledge, even though the case should be practically well by the time the report is received, and the community would be saved another focus of infection. Likewise, if antitoxin is given in a "mildly suspicious" case and the report comes back positive, then he continues on his way with a feeling of greater confidence in his own practice. The laboratory, when possible, always reports other findings than diphtheria, such as the presence of streptococcus and Vincent's angina, which we believe sometimes aid the physician.

We are aware that many sections of the State are a long ways from our laboratory. We have endeavored to overcome this by improved facilities for getting our mail, as well as sending it out, and by a night examination of cultures reaching us in the morning. In spite of this, however, the service is often unavoidably slow. Many of our progressive municipalities now have their own laboratories, which relieves the situation somewhat, but much further development is needed. I hope to see the day when every community will have its own local laboratory with the Central State Laboratory as a co-ordinating center.

In one community, Wytheville, diphtheria was prevalent last winter. The physicians of their own volition began a rigorous school inspection, cultured all sore noses and throats, isolated the carriers and quarantined them until negative cultures were obtained. The epidemic was soon brought under control and, though Wythe County had 4 deaths from diphtheria, none of these were in Wytheville and only one in that vicinity.

In conclusion, we wish to state that we know good luck and not great care saved some communities from having a higher diphtheria death rate. We also know that greater care would have lessened the death rate in practically all communities.

As the first steps, when diphtheria, or suspected diphtheria, appears we advocate:

1st. Education of the people, particularly as to the importance of calling in the doctor promptly for all sore throats.

2nd. That the physician culture all sore throats and noses, regardless of how mild they may appear to be.

3rd. The immediate administration of at least 10,000 units of antitoxin in all suspicious cases without waiting for a report on the culture; the use of antitoxin in all mild cases to avoid later complications, and plenty of antitoxin in severe cases.

4th. The quarantine of all cases, regardless of severity, until proven negative by at least one culture and preferably two. It is also desirable to culture all children in the house with a case before allowing them to return to school, as carriers among such children are not uncommon.

DISCUSSION.

DR. C. F. GRAHAM, Wytheville: I happen to be one of the physicians at Wytheville where there was an epidemic last year between the first day of November and the 23rd day of December. In fifty-three days there were fifty-three cases of diphtheria in the town of Wytheville and the surrounding country for a radius of 5 miles. We were very proud of the fact that there were no deaths.

Most of these cases developed in the public school, in the children of school age. The doctors got together and every morning before school opened we went up to the school and inspected every child's throat. From any children that showed any evidence of exudate in the throat, we had swabs taken and sent to the State Board of Health. We had Mr. Straus come up and cultures were made of all children in the rooms where the diphtheria was most prevalent. The first few days it looked as if we were not going to get much in the way of results. All the swabs taken in the two rooms in which there were most cases of diphtheria proved negative. But we kept up this inspection, and in a few days there was one child who had no temperature, perfectly normal pulse, no symptoms of any kind except just a little white spot about the size of a pin head on one of the tonsils, but the swab proved positive. That child was isolated at home the same as a diphtheria case; she was not given antitoxin because she never showed any signs of needing it and got all right from local treatment.

The State Board then instructed us to go into the homes in the section of the town where diphtheria was most prevalent and look after the children of pre-school age. This was done and in one home there were found three cases, all of nasal diphtheria, that had been going on for some time and had had no physician. One of these was of school age and had been going to school off and on every few days, would come home with a sore throat, get all right and go back to school again. This case was not at school the day the cultures were taken, nor was she present during the two weeks of inspection. These four carrier cases were isolated and treated, and the epidemic stopped almost as quickly as it started. That was the result we obtained by systematic examination.

DR. W. A. PLECKER, Richmond: This is another condition, like peritonitis, in which we can not rely on our vital statistics, especially from the mountainous counties. We are greatly in need of better statistics on diphtheria. As Dr. Hough brought out in his paper, there is a deficiency in the number of rural physicians. Many children die without any doctor, and when these death certificates reach us a very large percentage of them give the cause of death as croup when there was no diphtheria croup. When we send these transcripts to the Bureau of the Census in Washington, and they see croup, it goes to diphtheria, thus increasing our diphtheria rate.

Dr. ————: I would like to have Mr. Straus tell us what he thinks of active immunization as a general procedure, whether he favors it or not. Also, if I am correct in believing that toxin-antitoxin immunization gives at least five years of practical immunity, and whether he believes all children should have active immunization in the schools.

MR. A. H. STRAUS, (closing discussion): In reply to the last question, we have done no work here in Virginia on which to base an opinion. The principal work in this direction, I think, has been done in New York City, where, apparently, they have met with excellent success.

The general opinion that I have heard expressed is that it will carry the child over the period of greatest susceptibility. As we know from the Schick test, the older age groups are much less susceptible, and those who are advocating its use state that it will carry the child through this period of maximum susceptibility.

I do not believe that we would be justified in advocating its use in a wholesale way in the schools, although I can't see that any harm would be done. In order to be of value it would have to be started before diphtheria appeared in the school. After diphtheria is in a community it is too late to do very much in the administration of toxin-antitoxin as it takes from one to several months to produce immunity. So to be effective it would have to be started in the fall when school first opens. When diphtheria is once prevalent you are not going to help the situation a great deal unless all sorts of other measures are used in conjunction with it. In the household where a case of diphtheria develops you will have to continue always to use the immunizing dose of antitoxin.

CHANGES IN A SMALL TOWN BROUGHT ABOUT BY THE HEALTH DEPARTMENT.*

By B. B. BAGBY, M. D., West Point, Va.

The State Board of Health was re-organized in 1907 with Dr. E. G. Williams as Chairman. Since that time our summer practice has become very different from what it was previous to that time. But so gradual has been the change that few of us realize how great it has been.

I have kept a careful record of all my patients since I began to practice medicine. I moved to West Point in the spring of 1909. It is interesting and surprising to note the change that has taken place in my practice since that time. Recently, I have tabulated all of the *town* cases that I had during the five summer months of 1909 and compared them with the same five months of 1922. You notice that I say my *town* practice. I have left out my country practice as the Ford car has made too great a change in my country practice for me to take that into consideration.

TYPHOID FEVER, MALARIA AND CHOLERA INFANTUM DISAPPEAR.

During the five summer months of 1909 I saw 158 town patients. During the same period of 1922 I saw 202 town patients. Of the 158 patients seen in 1909, 96 had well defined cases of malaria, with chills, fever, sweats, etc.; 15 had cholera infantum, ileo-colitis, or dysentery, with two deaths; and seven had typhoid fever, making a total of 108 cases out of 158 that should have been prevented.

During the five summer months of 1922 I

*Read at the fifty-third annual meeting of the Medical Society of Virginia in Norfolk, October 31-November 3, 1922.

did not have in town a single typical case of malaria, typhoid fever or cholera infantum. I had one atypical case of malaria that was most probably contracted out of town. I had only one case of ileo-colitis that lasted over five days and this was the only case of dysentery or infectious diarrhoea in town this summer. And there has not been a case of typhoid fever in West Point since February, 1919. Dr. A. S. Hudson, the other physician in West Point, says he has not had a case of malaria, cholera infantum or typhoid fever this summer. So malaria, typhoid and infantile diarrhoea have about disappeared in West Point.

Typical Sanitary Conditions of 1909.

In 1909, our city fathers boasted of having the healthiest town in the State. But let us see how very unsanitary it was. Not a dwelling in town was completely screened. The negroes and poorer people had no screens at all. Every dwelling in town had an old fashioned open privy. No thought had ever been given to draining the marshes to rid the town of malarial mosquitoes; and the chief dairyman of the town spent a part of every night cleaning out the open privies. The contract for cleaning these was let to the lowest bidder, and the dairyman took the job at a very low figure as he needed the refuse to fertilize his dairy farm land. He did his scavenger work late at night or early in the morning and went directly from that work to milking his cows, bottling and delivering milk. This was done with the full knowledge and consent of the town authorities for several years before I came to West Point.

Modern Sanitary Methods Applied.

Now 80% of our milk is put up under thoroughly sanitary conditions. Even the poorest negro tenements of our town now have good window and door screens. The town and State authorities spent about $6,000 a few years ago to drain our marshes and there has not been a single case of malaria contracted in our town since that time.

Four years ago our town put in a complete water and sewerage system and the law now compels every house to connect with this system. Our water comes from artesian wells about 400 feet deep and is almost sterile. It is as perfect a water and sewerage system as could be obtained. The improvements in the health of our town have paid us (the citizens) many times over for the money expended in putting in the water works and draining our marshes.

To get these results has been no easy task. As soon as I moved to West Point I determined to get every home in town screened and I began to urge each malaria patient to take quinine for eight weeks after missing his chill. This brought down the malaria cases very rapidly. But it would have been impossible to have eradicated the disease if the State Board of Health had not helped us to drain our marshes.

Results Justify the Work.

We work so hard and apparently accomplish so little from day to day for the betterment of humanity that all of us at times get discouraged in our work. But after looking over my records of 13 years I am made to feel that our work in West Point has not been in vain, but rather a great blessing to humanity. And I am sure that ours has been the experience of many other physicians and towns in Virginia. I have not found a case of hookworm in five years. When I began to practice medicine in 1904, some sections in King and Queen County showed a hookworm infection of nearly 100% among the school children, and many adults were sallow, anaemic, sick and thin. Thanks to the State Board of Health these same people are now healthy, prosperous and happy. I know of several families of prosperous farmers that are now enjoying touring cars of their own, who a few years ago, on account of hookworm, were more or less dependent on charity.

More Work to be Done.

But our health work has only begun. We still have in my country practice many privies that are not fly proof; many wells that are open; much stagnant water that should be drained; and many dwellings that are not properly screened. Only a very small part of the population has been vaccinated against typhoid or diphtheria. At least 75% of my rural practice still have infected teeth or tonsils, and need a great deal more education to convince them of the injurious effects of these infections. Nothing has been done to eradicate syphilis, the most fatal of all infectious

diseases. Syphilis has caused more deaths in my practice in West Point than the following diseases all combined: measles, mumps, whooping cough, chicken pox, smallpox, diphtheria, scarlet fever, true pneumonia, malaria, and typhoid fever, and several more deaths than tuberculosis.

COUNTY HEALTH OFFICER THE GREAT NEED OF RURAL VIRGINIA.

There is greater work than ever for the health officer. We hear a great deal about the need of country physicians. The Legislature appropriated last year $5,000 a year to the University of Virginia to educate rural physicians. We may need a few more rural physicians in other parts of the State; none are needed in this section. But we do need very badly more rural health officers. The people in my section that are crying loudest for more rural physicians are the ones that are most bitterly opposed to employing a county health officer.

If we had a competent health unit in each county, instead of needing more rural physicians, we could do away with many that we now have, and our people would be far healthier and much better off financially.

I predict that the time will soon come when each county will have a complete public health unit, And then typhoid fever, cholera infantum, smallpox, and hookworm will in time be completely wiped out of Virginia and syphilis, tuberculosis, diphtheria, rheumatism, and arteriosclerosis will be on the rapid decline.

If each member of this Society will do his best to help the State Board of Health, this goal will be reached much sooner than many of us now even hope.

THE LAYMAN IN PUBLIC HEALTH.*

By ROY K. FLANNAGAN, M. D., Richmond, Va.
Assistant State Health Commissioner; Director Rural Health Work.

PREVENTION.—Prevention is the keynote of social progress, the song of the century, and everybody who is not a croaker is singing it. To fail to join in the chorus is to place oneself in the category of the "voiceless" of whom old Dr. Holmes wrote, "Alas for those who never sing but die with all their music in them." Every newspaper, every magazine, and every group functioning in the public interest is singing this song and the keynote rings clear.

The wastefulness of waiting for injurious effects to appear and then applying the remedy has become plain to all enlightened folk, and better plans are being made. Though the attempts of this generation to apply the preventive principle to all departments of social development have, by reason of the experimental nature of the methods employed, not always proven completely sucessful, all will agree as to the desirability of the aim.

ILLUSTRATION.—To give a few instances among many. The experiment is being made in the

Prevention of War by the formation of a League of Nations which proposes by practical means to bring about universal peace.

Prevention of Fire by public education and organization instead of devastation and economic loss.

Prevention of Drought by reforestation, impounding water and irrigation, instead of blasted crops and overwhelming floods.

Prevention of Accidents by safety devices and Safety First propaganda, instead of elaborate preparation for taking care of the injured.

Prevention of Drunkenness by prohibition, instead of inebriate asylums and debauched and wasted lives.

Prevention of Poverty by bringing about social justice instead of almsgiving and poorhouses.

Prevention of Delinquency by a probation system and juvenile courts instead of reform schools and houses of refuge.

Prevention of Crime by humanizing our courts and our police forces, and providing a system of prison farms instead of jails, chain gangs and penitentiaries.

Prevention of Feeblemindedness and Insanity by segregation, sympathetic treatment and the application of eugenic principles, instead of the perpetuation of dependents in ever increasing ratio.

And most important and more or less intimately related to all of the above:

Prevention of Disease and Premature Death by sustained attack upon causes, instead of the old time acceptance of sickness as a visitation of Providence or the Devil.

OPPOSITION.—Like all new ideas that have, since man first began to think, been responsible for human progress, the preventive idea

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has encountered and still is forced to fight all the forces of reaction, Ignorance, Selfishness and Bourbonism being the leaders of the opposition always.

The seemingly Utopian character of many of the preventive schemes proposed and the impossibility of their approximate realization within reasonable time has furnished ammunition to the enemies of all progress. Even organization for the prevention of disease and death, the most appealing as well as the least experimental of all schemes for human welfare, makes headway under constant fire.

That medical men should be found arrayed in the enemy's camp, would seem to be unthinkable, and yet there are instances of active opposition from doctors of apparent good standing.

Application.—The need for the application of the simplest principles of sanitary science is generally apparent to those who visit the smaller towns and villages throughout the state.

It is not even necessary always to go beyond the city's precincts, for many of our cities are flagrantly remiss in their support of health work, one-half of the cities of Virginia today have no health department in the modern meaning of that term. Richmond, Norfolk, Portsmouth, Newport News, Petersburg, Lynchburg, Roanoke, Danville, Alexandria, Charlottesville, Suffolk and South Boston, (11 cities and 1 town) have health officers giving their whole time and thought to measures for the reduction of preventable sickness. The rest of Virginia's cities and towns have more or less make-shift health organizations under the ostensible direction of busy medical men inadequately paid for part time service. I submit that this state of affairs is a reproach to the state in general and to the medical men in those cities in particular.

Inception.—Health work in Virginia owes its inception and development to devoted physicians. Where the doctors of a given city have combined to effect an adequate health organization they have been able invariably to secure it. This was true of the Richmond Health Department in 1906, and almost all health departments in Virginia since have owed their birth to medical initiative with the exception possibly of the few in extra cantonment zones, hastened in their development by war emergency.

Progression.—If progress has been slow in the cities, what may be said about rural Virginia? There are today nine organized county health departments in the state with whole time health officers in charge, most of them having one or two whole time sanitary officers and one or two public health nurses on the staff. These are Norfolk, Augusta, Fairfax, Arlington, Albemarle, Halifax, Wise, Russell, and Nansemond. Twelve other counties have supervised lay health men paid for their whole time. These are Chesterfield, Charlotte, Greenesville, Prince Edward, Henry, Smyth, Carroll, Mathews, Grayson, Pulaski, Roanoke and Wythe. Nine of these also have public health nurses in addition.

The following counties have public health county nurses operating in them, supported in the main by local welfare organizations: Loudoun, Hanover, Essex, Louisa, Amherst, Powhatan, Elizabeth City, Clarke, Smyth, Princess Anne, Prince George, Accomac, Bedford, Frederick, Mecklenburg, Shenandoah.

This leaves 63, or approximately 2/3 of Virginia counties unprovided with any workers devoting their entire time to improving health conditions.

It is no small thing to have induced 37 counties within the period of the 14 short years of the State Board of Health's existence to provide mainly from their own funds some form of paid health work, and the State Board of Health is proud of the record.

Anticipation.—When, however, we consider that the majority of the children in two-thirds of Virginia's area are now growing up with only haphazard arrangements for the correction of their physical defects, and with no agency systematically at work to stimulate the construction of sanitary conveniences or improve the many dangerous sources of water supply, with no official organization regularly employed to deal with epidemics or plan for the reduction of the death rate, it is glaringly apparent that those who hinder the development of plans for furnishing relief of such a situation will most certainly be pushed aside.

Definition.—Disease prevention as you all know involves on the part of the health officer roughly—

1. A knowledge of the presence of infectious disease as soon as possible after it occurs, and the ability to apply quarantine and release, and to induce immuni-

zation and treatment in proper cases.

2. A knowledge of how and where to find breeding places of disease and the ability to abate or direct the abatement of them.

This involves among other things questions of sewage disposal, water supply, milk and food inspection, mosquito control, child welfare, school inspection, organization of corrective clinics, and a thoroughgoing educational campaign in the interest of all phases of the public health, with an active, persistent and progressive effort to get results in a reduction of disease and death.

Assumption.—It has always been impressed upon the public that the medical man is alone qualified by training to attend to disease control measures. That was undoubtedly true at the time when many, perhaps most of us, gained our medical degrees. No other class of men 10 years ago were so well qualified as we to do public health work. We were supposed to know infectious disease when we saw it; we were supposed to be trained in a knowledge of the causes of infectious disease; consequently we assumed before the public the attitude, and the public accepted the assumption at its face value, that what we did not know about how to prevent these infectious diseases was not worth knowing. This, I believe, is a fair statement of the case. I know that is the way I felt about it when I first took up public health work. Now, what really are the facts?

Qualification.—Practice is supposed to make perfect, is the training of the doctor, the real training I mean, the training and practice he gets in doing his job of healing the sick;—is this training such as would qualify him to deal with the sordid causes that bring about that sickness?

Can he concentrate his attention on the community side of his patient's disease and do justice to the patient at the same time? Entirely aside from all mercenary considerations, which, since the doctor is human, must frequently arise, the feat is almost impossible.

Devotion.—All of us prefer as our personal physician one who is singleminded in his profession and we are apt to call that one into our family whom we deem most devoted to his patients. In the emergency of personal or family illness the public welfare can go hang so far as we are concerned and the doctor who is officially or unofficially most concerned about the community welfare is not usually desired at that time, however, we admire his public spirit at other times. This is also the attitude of the public. The profession of medicine, is a hard taskmaster, so, also, is the profession of Public Health.

Limitation.—The doctor has never qualified as a privy builder, and sanitary privy building is the first job of a town or county health officer. The doctor cannot be expected to know much about the latest development in scavenger service, and you can be assured that there is much to be known. Medical practice does not provide a working knowledge of the best construction in septic tanks, or how to direct a laborer to build one.

The average doctor has given no thought to the best means of getting Farmer Jones to improve his water supply—the old oaken bucket type or wide open spring. He is slow indeed to cast reflections on such a time honored institution.

In the nature of things he knows little of modern methods of milk inspection, or mosquito control, or school inspection, or the organization of correctional clinics, or of publicity methods so necessary to arousing the people to the importance of public health work. It is seriously to be questioned too as to whether the doctor knows much about the detail of that intricate performance—the prevention of flies.

There is no question but that he can readily learn these things if he is not too old or set in his ways. It is not to be doubted, however, that he never successfully practices medicine and public health at one and the same time. The attempt to do so makes him more or less of a dub at both. The part time health officer cannot in justice to his patients or himself give proper service to the public, for it will always be true that "no man can serve two masters."

Action.—What then can be done? If the doctor does not act, who will? Let us see.

In engaging a person for a specific work it is recognized that the ideal person is hard to find, and if found is expensive, so we usually try to come as close as possible to our ideal with the means at command. Our means say, is $3.000 for salary and all other expenses —nothing ideal about that you will say. (It is worthy of remark, however, that most part

time medical health officers in the cities and towns of the state get much less). The great need is for someone to do the essential things in the control of disease. Is the first need a diagnostician? A medical health officer is rarely called in to diagnose a case—the family physician does that and is apt to promptly resent the questioning of his diagnosis. Health officer diagnosis, therefore, is rarely if ever necessary. This also rules out the immediate necessity of establishing a local laboratory, since the physician is supposed to secure all practicable laboratory tests in making his diagnosis. If infectious disease is discovered the doctor reports the case to the health officer whose business it is to take appropriate action. In using our $3,000 then, the part of wisdom from the standpoint of the public would seem to be to employ some sensible person to take action who is willing to give his whole time for $1,800 or $2,000 a year, with the rest for expenses.

Sanitation and Hygiene.—It is common knowledge that a non-medical man can apply quarantine, can secure culture specimens from the family physician when necessary, can advise school authorities as to the presence of contagious disease, can prosecute, can abate nuisances with disinfectants and a spade, if necessary, can enforce sewer connections and construct septic tanks, can organize privy campaigns and build privies, if necessary, throughout unsewered areas.

He can organize an efficient scavenger service. Without fear or favor he can apply the law, for cleaning up the town or the county is what he is paid for.

He can even advise and insist upon closing the sacred old well or spring without mortally offending a good paying patron.

Without technical knowledge he still can greatly improve the milk and food supply by frequent inspections.

Mosquito control, organization work for school clinics and a comprehensive public health publicity campaign do not require medical knowledge and the kind of talent capable of doing work of this character may be obtained for much less than a good doctor can afford to take.

Reputation.—No doctor who values his professional reputation can afford to give inadequate public health service in the present state of the public mind. The public is informed and is clamoring for adequate health protection, and the doctor must in justice to himself refuse the attempt unless he is prepared to give his whole time to the job.

If he will not make the sacrifice then let him recognize the possibility of a non-medical man giving fine service at a lower cost, and back such a man to the limit. A lay health officer trained in a good health department offers to my mind the best available solution to the town and county public health problem.

Such a man would under state law act always in subordination to medical boards of health, and consequently the dangers of grave mistakes on account of lack of medical knowledge would be greatly minimized.

Demonstration.—Is this an impossible program? My answer is that in a number of places in Virginia it is working successfully. In Henry County, in Chesterfield, in Charlotte, in Carroll, in Prince Edward, and in other counties, the State Board of Health having been under the necessity of organizing some kind of service has wisely cut the garment according to the cloth. On a budget of from $2,500 to $3,000 yearly, the counties are being gradually sanitated and educated to demand and pay for a greater and greater degree of public health protection. If they had waited until they could pay for adequate medical health service the children of the present day in these counties would die of physical disability or of crippled old age, instead of as at present receiving a large measure of corrective attention. Hookworm, typhoid fever and dysentery would still take their usual toll instead of yielding steadily to systematic sanitation.

At least one-third of our counties will not in this generation be in position to pay for adequate medical public health service. These counties must be given better attention than they are now receiving, the towns of the State must also deal with their health problems in the same way.

Let us, therefore, develop in this state a sufficient number of practical sanitarians to meet our needs.

Cooperation.—The State Board of Health confidently counts upon the medical profession of Virginia's cooperation in its efforts to bring to every spot in our state *some*, if not all of the public health benefits enjoyed by those parts wealthier and better favored.

DR. W. E. ANDERSON, Farmville: The system is working well in Prince Edward County, where I have been medical health officer for some time, and I am heartily in accord with the man who is doing the work.

I arranged last year, through the State Board of Health, to have the county nurses do the vaccination work in the schools. They can do that detail work more efficiently and more economically than I can do it.

I particularly want to emphasize the great amount of good this man can do going from house to house looking after sanitary conditions. I will enthusiastically co-operate with any health officer, because it is one of the most important fields connected with our profession.

OXYGEN SUPPLY AND DEMAND IN GENERAL ANESTHESIA.*

By ROBERT CAMDEN WHITEHEAD, M. D., Norfolk, Va.

The importance of an abundant supply of air to the patient during the induction and maintenance of general anesthesia has been realized since the earliest days of general anesthetics and care has been ever taken to avoid, as far as possible, any interference with the oxygen supply under these conditions. Physiological research has demonstrated that in health the supply of oxygen through the respiratory organs and the consumption of oxygen by the body chemistry, are of a certain standard according to the area of the body surface. Further, that in certain disease conditions the ratio between the oxygen supplied by the lungs and the oxygen required by the body metabolism is markedly reduced and that cyanosis and respiratory distress are more easily and readily induced in these patients than in the normal.

Two factors bear directly on this important point, viz., the vital capacity of the lungs and the rate of metabolism; for if the vital capacity of the lungs be reduced, the oxygen supply is diminished and again, if the rate of metabolism is increased the demand of the body chemistry for oxygen proportionately encroaches on the available supply. Under either of these conditions any displacement of the oxygen of the respiratory air by the addition of the vapors of the anesthetic administered, will further reduce the ratio between supply and demand and the point of oxygen deficiency, acute anoxemia, will be more nearly approached.

For years it has been known that persons suffering with certain respiratory and cardiac diseases, such as pulmonary tuberculosis, acute bronchitis, pleurisy with effusion, etc., and the organic diseases of the heart, are for various reasons bad anesthetic risks; that they early and easily become cyanosed and that danger of death from the anesthetic is increased. Again, patients with hyperpyrexia and toxic goitres at the crest of the toxemia have been placed in the same class. Operative measures in these cases are deferred, if possible, until these conditions are relieved.

The increased risk in these cases seems due in large measure to one underlying fault; to wit, the decreased ratio between the oxygen requirements of the body and the oxygen supply of the lungs.

OXYGEN SUPPLY.

Peabody and Wentworth in 1917 stated that the dyspnea of heart disease seemed to depend largely on the inability to increase the depth of respiration in a normal manner, and that this inability to breathe deeply corresponds to a diminished vital capacity of the lungs. They further show that in a classification according to height, there is in normal individuals a standard vital capacity subject to a variation of plus or minus 10%.

Wilson and Edwards in J. A. M. A., April 15, 1922, show from their investigations of 362 normal children between the ages of 6 and 16 years a standard vital capacity of 1.93 litres per sq. meter of body surface, or 15.5 c.c. for each centimeter of height. The average vital capacity in health is about 3,500 c.c. and is the air which can be expelled from the lungs after as deep a breath as possible. The normal inspiration, or Tidal Air, is on the average 500 c.c., which is sufficient to maintain the oxygen in the lungs at about 15%. In health, should the percentage of oxygen in the lungs become depleted, the loss is immediately made good by deep inspiration, without conscious effort on the part of the person. Should there be a diminished vital capcaity with the corresponding inability to breathe deeply in a normal manner, the deficiency must be overcome by increased frequency of inspiration.

Peabody and Wentworth have classified patients with heart disease according to the diminution of the vital capacity of the lungs as follows: Class (1) reduction 10% with few symptoms referable to the heart; Class (2) reduction 10% to 30% dyspnea on exertion; Class (3) reduction 30% to 60% dyspnea on

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moderate exercise; Class (4) 60% and over, cardiac failure.

In the *American Journal of Diseases of Children* (November 1921), Wilson and Edwards show the percentage of reduction of the vital capacity of the lungs in children suffering with various pulmonary and cardiac disorders as found in their investigations.

Tracheo-bronchial adenopathy	20-30%
Acute bronchitis	10-20%
Bronchial asthma—between attacks	0-30%
Emphysema	10-15%
Pleurisy with effusion	30-40%
Lobar pneumonia	40-50%
Pulmonary tuberculosis	30-50%
Organic Heart Disease class (1)	0-3%
class (2)	20-35%
class (3)	35-80%

It seems from these investigations that the diminished vital capacity of the lungs with its consequent interference with the proper oxygenation of the blood is a condition not infrequently encountered; and that the reduction in the oxygen supply may be so great as to seriously approach the point of the minimum oxygen requirements of the body metabolism. Under such circumstances, the administration of an anesthetic by further reduction of the respiratory oxygen supply, might easily overstep the point of safety, producing a definite oxygen deficiency.

Oxygen Consumption.

The study of the basal metabolism has shown that in certain diseases the body is consuming more oxygen than in health, due to the increased rate of body metabolism and that at times this is extremely high.

In hyperthyroidism and hyperpyrexia the metabolic rate is increased and in many other conditions there may be an increased rate of basal metabolism though not constant. In myxoedma and hyperthyroidism the rate is decreased. But it is not with the diagnostic import of the rate of basal metabolism that this paper has to deal, but with the fact that an increased rate of metabolism is an increased rate of oxygen consumption.

Briefly, the estimate of the rate of basal metabolism is the estimate of the calories produced per hour, per square meter of the body surface, for a given age and sex. This estimate is made, by the indirect method, by the measurement of the oxygen consumed in a given time and is expressed in percentage plus or minus.

A patient suffering with hyperthyroidism with say plus 50% basal metabolic rate is consuming in the same number of minutes or hours 50% more oxygen than that patient would consume in health. This increased consumption of oxygen results in an encroachment on the available oxygen supply, thereby reducing the ratio between supply and demand.

For about two years Dr. R. L. Payne has been using the closed circuit nitrous-oxide-oxygen anesthesia in operation on the thyroid gland and we have found by our studies of these cases that the oxygen requirements during anesthesia correspond closely to the basal metabolic rate; that those persons with increased rate require more oxygen in the respiratory circuit than persons with a normal rate; and that the percentage of increase in the oxygen required is approximately the percentage of increase in the rate of basal metabolism.

To illustrate: Mrs. T. came for operation for exophthamic goitre. Her rate of basal metabolism was plus 35%. Under nitrous-oxide-oxygen anesthesia, it was found that she required 40% more oxygen than the average person with no thyroid involvement. Any reduction of the oxygen below this amount was accompanied by cyanosis. Further, this increased amount of oxygen prevented the administration of sufficient nitrous oxide gas. When the nitrous oxide was pushed to the point of securing the required relaxation, the oxygen supply was encroached upon to such an extent as to produce dangerous symptoms. To overcome this complex, 1% ether was required to give the proper relaxation.

In certain cases both conditions which tend to reduce the ratio between supply and demand may be present. We may have existing pulmonary or cardiac disease, associated with hyperthyroidism; or a damaged heart associated with some intercurrent disease which has produced a marked rise of body temperature. In exophthalmic goitres of long standing the myocardial changes may be so extensive as to seriously cripple the heart and thus we would have a diminished vital capacity of the lungs due to the cardiac involvement plus the increased rate of oxygen consumption due to the thyroid toxemia. In these cases with the reduction of the supply and the increase of the demand, the ratio is more markedly diminished.

The whole structure of general anesthesia

is based on the possibility of administering to the patient sufficient anesthestic to induce the desired degree of anesthesia, at the same time allowing the patient to have sufficient oxygen to carry on the vital function of the body. In those cases where there is no reduction between the oxygen supply and demand this is accomplished with little danger but where the oxygen supply is reduced as in diminished vital capacity of the lungs or the oxygen consumption is increased as in hyperthyroidism, the additional insult to the already embarrassed respiratory system by the administration of an anesthetic may be fraught with grave consequences. Our study of cases on the surgical service of Dr. R. L. Payne at St. Vincent's Hospital has demonstrated that in hyperthyroidism with a rate of basal metabolism of plus 35% or below, nitrous-oxide-oxygen anesthesia may be safely employed; but in cases with a higher rate, ether must supplement the gas-oxygen or ether by the open method be used. Given a case with a basal metabolic rate above plus 50%, we consider the administration of any anesthetic a grave risk and operative measures are, if possible, postponed until the rate is reduced. For this purpose we employ rest in bed and radium. This latter has proven very satisfactory in ameliorating the symptoms and reducing the rate of basal metabolism.

Conclusion.

1. That a knowledge of the vital capacity of the lungs and the rate of basal metabolism is necessary to a proper selection of cases for general anesthesia.
2. That this kowledge is of value to the anesthetist and is a guide in the induction and maintenance of anesthesia.
3. That from the standpoint of the anesthetist a knowledge of the basal metabolic rate is of value in the selection of the opportune time for operative measures.
4. Operative cases selected from these studies permit the surgeon to proceed with the assurance that the patient is able to stand the administration of the anesthetic necessary for operative interference.

Discussion.

Dr. R. L. Payne, Norfolk: I am not as familiar with these details as I would like to be. The subject has been worked out by Dr. Whitehead and Miss Ide, anesthetist at St. Vincent's Hospital, over a considerable period of time and with great thoroughness on their part. The practical application of these principles has been of great value in selecting the proper cases and time for operative measures in thyroid disease. For ordinary operative work, there is required in nitrous-oxide oxygen anesthesia a mixture containing 89% gas. This leaves a 11% supply of oxygen, which is 3% in excess of the minimum oxygen requirement of the normal individual. Should there be a definite increase in the rate of metabolism with the consequent increased oxygen consumption, the minimum point of 8% would be raised and the excess oxygen supply of 3% reduced. In a case plus 50% basal metabolism the minimum oxygen requirement would be 12% which would allow a possibility of only 88% gas. In such case a small amount of ether would be necessary to obtain the proper relaxation. The advantage of these determinations is in the selection of the anesthetic to suit the individual case.

SPONDYLITIS DEFORMANS (MARIE-STRUMPELL TYPE.)*

By ALLEN F. VOSHELL, M. D., University, Va.

In my orthopedic work of the past several years a sufficient number of cases of Marie-Strumpell spondylitis deformans have been seen in the *late* stages of the deformity which were not diagnosed as such, that I feel justified in bringing this subject before you at this time, not as an original contribution or an attempt at a complete review of the literature, but to refresh your memories along this line in the hope that these cases may in the future be given much earlier treatment, thereby preventing the painful consequences and unfortunate outcome which has been so common in the past. The diagnoses usually accorded the majority of these patients have been sciatica, hip disease, indigestion and gastric crises, and appendicitis, some having had an appendectomy with a normal appendix and no relief following. The reason for these errors is easily explainable as soon as the causative factor of the pain is realized. I am sure that many of you, if not all, have records of young adults between twenty and thirty years of age who complained of pain in their backs, hips, abdomen or legs, and who upon examination showed vertebral ankylosis; or perhaps your case was much older but had begun the ankylosis at the above age and had become completely stiffened before being seen by you. It *is* then the ankylosis beginning at about twenty-three and finishing about thirty upon which I wish to dwell a little for the purpose of soliciting, first, your aid in helping to treat these patients much earlier than has been done, which therefore necessitates an earlier diagnosis, second your advice and co-operation as regards the etio-

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logical factor on the one hand and the best method of improved treatment on the other. The treatment has hardly changed a bit in twenty-five years; the cause has never been worked out though many theories have been advanced.

There are various ankyloses which develop in the human body but I wish to limit my remarks to the one accredited by most authors to Marie and Strumpell, the ankylosis limited to the spine alone, not involving any of the other joints. I find in the literature some remarks by Bechterew describing a similar condition to the one mentioned differing only in its point of origin being in the cervical rather than the lumbar or dorsal regions. The end results are identical and my impression from the few articles read is that the conditions are one and the same, the point of origin not being sufficient evidence for separation. I therefore am including this latter under the same heading.

This type of deforming spondylitis without known etiology has been recognized for many years but no definite progress has been made with regard to cause or prevention, we do only "sit tight" and let it go its course, contenting ourselves in keeping down the secondary deformities. I hope to carry through some work along the lines of prevention, trusting that the etiology may be ferreted out afterwards. The gonococcus has been held responsible but without convincing proof, as has also the spirochaeta pallida. The deformity consists of a gradually but consistently progressing ankylosis between the vertebrae themselves, and between the dorsal vertebrae and ribs, in young adults of about twenty to thirty years of age (no other joints being involved except very infrequently the hips as a late complication) due to bony outgrowths or lips from each vertebra along its intervertebral ligaments until the fusion of these gives a complete stabilization of the spine, often called a "poker back," as though molten bone had been poured down their back. The posture carried by the patient during this progressive stage naturally determines the final position his spine assumes, so that *at present* the physician's advice is of service in this regard only.

The history and examination of this class of patients are about as would be expected when we know the result. The patient first complains of a slight stiffness in his back or neck which is relieved by bending forward a little, then an ache followed by pain begins to be noticeable and the patient bends forward more. The patient does not realize that he has flexed his spine until someone calls his attention to the stoop developed; then he tries to straighten up and carry himself better but is unable to do so due to the anterior vertebral ligaments and the pain of forced motion. There must be swelling and irritation of all the tissues closely associated with the vertebral column if the intense pain suffered by these patients is any indication. This inability to straighten up places the spine in a very poor position for the following fusion and should therefore first and foremost be prevented, particularly as the secondary pressure on the nerves by the bony projections which grow out causes more pain and its consequent increased flexion; some of these cases become bent nearly to a right angle at the waist and fuse there. Therefore, the actual amount of observable disfigurement is in direct proportion to the degree of flexion. As the above mentioned lipping progresses, its course is clearly demonstrable in the X-ray pictures, the nerve trunks become irritated and pinched causing severe pains to develop, *referred* however to the region or organs supplied by these trunks and their branches, usually bilateral. This stage of the disease is the time when a physician is consulted as these referred pains are definite and severe and cannot be passed off with a smile; they demand attention; these pains also seem sometimes to mislead the examiner and cause him to institute treatment for an entirely different condition followed by scant relief for the patient. Toward the middle of the course the patient begins to be limited in the extent of his respiratory excursions and this limitation progresses slowly until almost no thoracic respiration is performed, one-half inch being considerable for them, thus opening them to pulmonary complications, though rarely of a tuberculous nature. This ankylosis of the ribs at their costo-vertebral junction also plays a large part in the peculiar characteristic appearance of these cases, as well as limiting effective treatment for the correction of the deformity. When complete stability of both disease and spine has been reached all pain ceases, not to return, and the patient is left with a poker back, abdominal respiration entirely, and no *pain*. The diagnosis of these cases is quite simple, provided a *careful* his-

tory is taken, for it is the false impression gained from the patient's *recent* history that is usually misleading to the casual observer who then treats for appendicitis, gall bladder, or what not. One should always look back to the origin of the nerves involved in cases of pain before definite local treatment is instituted. The fault is in not crediting the spine as being a possible location for the origin of pain in nerve extremities.

There seems to be a certain type of individual which is more prone to develop Marie-Strumpell spondylitis than any other; that is the group of individuals who are thin, bony, never get fat, who have never been muscular, though they need not necessarily be chronic invalids or weaklings. So far as I have gone into the literature no case has been reported in the female sex, which should be of some significance, and cases arising in adults over thirty are unusual though not impossible. The posture assumed is variable in degree but of the same general trend; a C curve flexion of the spine as a whole including the cervical; a rigidity of the head by muscular spasm; and elevation of the shoulders with a tendency to forward protrusion and rotation, thus causing the scapulae to appear prominent or winged; and a certain amount of flexion of one or both hips which complicates the posture as a whole by tipping the body to one side. The shoulders give the impression that the thorax and head are rushing forward too fast for them to keep up. Hence, these people have a peculiar stoop which is almost typical. The gait is without the usual freedom and swing; it is stiff, all the spring being in the feet, and all turning is done as a unit, no rotation being possible in the spine itself; it is quite typical during the progressive stage, in fact almost diagnostic.

There is marked muscle spasm of the spinal groups of muscles, a moderate protuberant lower abdomen, almost complete limitation of motion in all directions in the spine with acute pain on attempted motion, pain on pressure over the intervertebral spaces both anterior and posterior, considerable psoas muscle contraction preventing full extension at the hips, inability to lie supine, except for a very short period, due to flexion throughout the body, almost complete obliteration of respiratory excursion. There are usually no demonstrable lesions in the other joints of the body except sometimes the hips though this complication is now generally conceded to be secondary and due to the prolonged muscular contraction of the psoas muscles. A peculiar feature is that the axis and atlas are rarely involved, or if so only very late in the course, becoming ankylosed as the very last step. The lumbar spine is the most frequent location by far for the primary lesion, then the dorsal and cervical in order, although statistics do differ considerably on this point. No superficial signs of irritation or inflammation are ever discernible. The patient's general condition suffers markedly, due principally to the constant presence of pain during the day, and more pain at night, especially if he sleeps upon the usual very springy bed with a hole in the middle. Hence, loss of appetite, loss of weight, loss of sleep are very important secondary complications, as is also the markedly decreased respiratory excursion, even being as small as one-fourth of an inch.

The X-ray pictures show a gradual progressive growth from the bodies of the vertebrae along the intervertebral ligaments with a complete fusion as the end stage; no areas of destruction have been observed.

The laboratory tests are usually negative throughout.

The treatment heretofore instituted has been to inform the patient as to his future outlook, a stiff spine forever after five years of discomfort. We then essay to stretch and straighten the individual very gradually as to spine and hips until he has returned to as *near* normal as possible, and to hold him thus by braces or other apparatus until the spine has become solidly ankylosed and the progression has ceased. This whole course lasts from two to six years or thereabouts. The one most gratifying point in this method, and will have to be in all methods, is that the patient gets relief from pain almost immediately the above system has begun, his appetite and strength begin to return, and he begins to sleep again and feel rested.

It is the early stage, however, which should interest us particularly, not only as to the differential diagnosis from the general arthritic and disease conditions, which require specialized technique and practise, but as to the prevention of the ankylosis and the relief from symptoms. If we can not find the cause of this disease or deformity (it may be both

who knows?) we can perhaps help the poor unfortunate who has developed this misery and prevent the apparently unpreventable stiffness, and then find the cause later;—put the cart before the horse, so to speak. It is in regard to this procedure that we hope with the help of our masseur, Dr. Moritz, to make some progress in the near future. We have two cases now under treatment, one of whom is only partially ankylosed.

I close, then, with this plea, that all will remember this type of deformity and its consequences when a case of obscure pain temporarily baffles you, will carefully examine the spine itself as well as X-ray plates of as many vertebrae as necessity indicates, and will help us to clarify this problem in the near future. We are trying and I think I may say we are progressing, so that the future *does* hold out hope as it never has before for these cases.

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SOME COMMENTS ON THE SUBJECT OF VERTIGO.*

By JOHN DUNN, M. D., Richmond, Va.

Whenever the subject of vertigo and nystagmus and the interpretation of the vestibular nerve tests comes up for discussion, Barany's masterly work must persistently appear first to our minds. I always felt, however, that both he and his immediate successors had left something unfinished so far as the completion of the practical application of their discoveries was concerned. This feeling was not present when irritation or destruction of the vestibular terminals by inflammatory processes was under consideration. It was when the interpretation of disturbances of the intracranial pathways of the vestibular nerves came into question that this feeling arose. With the persual of Dr. I. N. Jones' work on "Equilibrium and Vertigo," it, to a great extent, disappeared and it was at once evident that the hitherto poorly explored paths of the vestibular nerves had for practical purposes been mapped out as they had not previously been done. Dr. Jones' book is delightful; it is full of riches for those of us whose ideas on some of its subject matter, if they existed at all, were, to say the least, hazy. As I read and digested its pages, I thought otological writings would from then on contain many comments on its claims and that my confreres would everywhere bring its teachings into daily use.

Such seemingly has not proven to be the case. Since 1918, nearly all of the few articles I have seen from the pens of our American otologists have concerned themselves directly with statistics dealing with the results of the turning or caloric tests in cases of apparently normal individuals. Rarely does one find a serious effort to explain the deviations from the normal which must have occurred time and again in the many cases upon which their statistics are based. If we except Wilson's paper on "Labyrinthine Tonus," I know of no article on the subject of the vestibular nerve written by an American otologist since the appearance of "Equilibrium and Vertigo" which concerns itself with the deeper problems of the extremely important new lessons so carefully thought out and illustrated in Dr. Jones' book. Judging from this silence, we might superficially infer that our American confreres have accepted in toto Dr. Jones' explanations and conclusions as final and the incident of the vestibular problem, save for minor anatomical details, as closed. It is certainly difficult not to recognize the master hand in Dr. Jones' treatment of the intracranial disturbances of the vestibular pathways. No such clear conception exists in the European otological world if I may judge from the articles which have appeared in our special journals; or, if it exist, those who possess it seem to lack the power of the clear presentation which marks Dr. Jones' book.

What I have just said often comes to my mind when the subject of vertigo and nystagmus presents itself, and it is mainly because so few of my immediate confreres seem willing to discuss with any enthusiasm the details of this important chapter in our special field. I have wondered why this is so. It is not from any inability on their part to understand the vestibular reactions to the modern tests. It is not from any unwillingness on their part to give the time necessary for the making of these tests, nor is it from any lack of appreciation of their value. There seem to me to be three main reasons why this subject is not as generally provocative of discussion as tonsil-

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lectomy or corneal ulcer. First, the relatively few cases in the daily practice of most of our aurists which seemingly call for the application of these tests. Secondly, the difficulty of obtaining from the text books a clear working mental picture of the physiology of vestibular disturbance, and, thirdly, the fact of the necessity to be so well grounded in brain anatomy and physiology that one can distinctly visualize the intracranial pathways of the vestibular nerves, and their exact relations to the adjoining cerebral or cerebellar structures. Without this last knowledge, attempts to interpret the results of the vestibular testings in brain cases are well nigh worthless. This thirdly contains the necessity of knowledge of the pathological conditions to be found along the course of the vestibular nerves and their destructive as well as their pressure effects upon the portions of the vestibular tracts which they affect. Here also must be included the fact that to only a few otologists is the opportunity afforded of examining a sufficient number of brain cases for them to be able to give to the variations in the vestibular responses their proper values.

Experience has taught most of us to refer in a general way aural vertigo to its source and in the same general way we have an idea what we are to expect from remedial agents plus the vis medicatrix naturae—and with this most of us have been satisfied, just as we are satisfied with the treatment of, say, the common acute forms of head colds. In the majority of these latter cases we follow a well known routine, which experience has taught us will in a short time be followed by the disappearance of the annoying nasal symptoms. We do not in every such case examine microscopically a smear from the nasal secretion, or look into the exact condition of the nose and throat, and of the kidneys and of the digestive tract. These latter examinations are only exceptionally done before we prescribe in cases of head colds and, then, after our routine treatment has failed to produce rapidly the expected cure. With vertigo the case is very different. In head colds the diseased area is visible to our inspection, if we choose to look. In vestibular disturbance the area affected is invisible. In head colds we can see the effects which follow our treatment; in vestibular diseases we measure the effects of our treatment by our patient's say so—and unless we test out the reactions of the vestibular nerves we remain in ignorance as to whether that which caused the vertigo has or has not left the vestibular nerve functioning. For example: Mrs. I., aged 40, in the course of mumps became suddenly and permanently deaf in one ear. She had a slight vertigo. Examination with the coloric test the next day revealed perfectly functioning semi-circular canals in the deaf ear.

A., aged 14, with perfect hearing in both ears, became suddenly deaf in the left ear during the course of mumps. He, too, suffered from transient vertigo. Mrs. I., became suddenly deaf from mumps, had transient vertigo and examination revealed uninjured semi-circular canals. Master A. gave the same history. Superficially we might claim the right to say that Master A.'s semi-circular canals were also uninjured—but what were the facts? Examination of his vestibular reactions showed that in the left ear which was stone-deaf there was absolutely no response whatever from any of the three semi-circular canals, while in the right ear, whose hearing was normal, only the horizontal or vertical canals, I forget now which, responded. These cases are instructive. They seem to show that in mumps the active poison may affect either the cochlear nerves alone, or one or more of the vestibular branches alone, or both the cochlear and all of the vestibular branches.

But these comments are by the way and merely illustrate the point I wish to make, viz.: All cases of vertigo deserve to have a careful examination of the functions of the vestibular nerves and it is only when we know the condition of the several divisions of these nerves and have adjusted them into their proper place in the clinical picture are we able to appreciate the true condition of our patient.

All cases of syphilis should be submitted to tests of the functions of the vestibular nerves, if one cares to have all of the information it is possible to obtain in regard to the condition of the intracranial structures. I have had no experience in the primary or secondary stages, but with cases of congenital and tertiary syphilis, the prolonged delay in the responses to the caloric tests, the at times correct but feeble nystagmus, the slight vertigo and nausea and with them the slight, now and then absent, past pointing, sometimes tell of a basal condition unsuspected. Two cases will serve as illustration.

XUM

Mary L., aged 12, syphilitic by heredity, shows severe interstitial keratitis, atrophic catarrh, Hutchinson's teeth, etc. The vestibular responses are normal. Ellen K., aged 10, shows also interstitial keratitis, Hutchinson's teeth, etc. The vestibular tests, however, show markedly delayed responses; apparent absence of all rotary nystagmus; horizontal nystagmus present; absence of all vertigo, nausea, past pointing and falling. We cannot infer in regard to the degree of activity of the vestibular responses. We must test them. Whenever possible, in all cases of central paralysis or paresis of one or more of the cranial nerves, whether occurring acutely or slowly, the functions of the vestibular nerves should be examined. The following two cases will show the importance of this statement.

Mr. X., aged 58, had a short attack of unconsciousness while at dinner. He was sent to me because, on recovery, he was hoarse. Laryngoscopic examination revealed a complete paralysis of the left recurrent laryngeal nerve. There had been previous slight attacks of vertigo and tumor was suspected. Examination of the vestibular nerves showed marked bilateral lessening of the responses. The Wassermann test was strongly positive.

Again Mr. L., aged 64, was sent to me for vertigo of a year's standing. His description of his "vertigo" soon showed that it was not of vestibular, but of ocular origin. Paralysis of the left inferior rectus was found to be present. Formerly, owing to the age of the patient, one would have been satisfied with this, having attributed the paralysis to vascular disturbance in the nuclear region of the third nerve, and this too, in the face of the fact that no marked cardio-vascular nephritic disturbance could be found. Examination of the vestibular nerves showed marked delay in responses to the caloric tests. When the responses finally came the eyes showed a very feeble nystagmus—but correct as far as the paralysis of the inferior rectus would permit. Vertigo was almost entirely absent and no past pointing could be demonstrated. Further examination revealed absence of the patellar reflexes. The patient had already for a considerable length of time been on specific remedies. In both of the above cases the hearing was normal and in neither case was tinnitus present. I do not understand the exact pathology of these vestibular disturbances. The auditory fibres escape injury that can be measured. Why the vestibular elements are affected and where will some day be discovered. The absence or near-absence of past pointing suggests that possibly we are dealing with a disturbance in the mid-brain at the point where the proprioceptive impulses from the cervical muscles met the impulses from the vestibular terminals and that the lesion is similar in character to that which in locomotor ataxia abolishes the patellar reflex and in the ciliary ganglion gives rise to the Argyll-Robertson pupil. This, however, is mere conjecture, and probably an incorrect one.

It is only by making examination of all of our cases of vertigo that we are able to appreciate the great variations in the intensity of the responses in active healthy vestibular systems. In some persons the responses to the caloric test are, we may say, almost violent, so prolonged is the nausea nad vertigo, and it is not always easy to persuade the patient to submit to repetition of the test; in others the responses are hardly more than unpleasant, unless the tests are prolonged unnecessarily. It is interesting, too to observe how in one case vertigo is more complained of than nausea, while in another the responses on the part of the pneumogastric are much the most unpleasant. I have in mind two cases, both women, both for a considerable time past have been subject to repeated attacks of vertigo of a more or less mild type.

In both cases the form of vertigo superficially suggests that it is a transient vascular disturbance of the whole vestibular terminal system. Both cases react violently in response to the caloric tests. In the one case the response is mild nausea, but severe and prolonged vertigo; in the other, severe and prolonged nausea but mild vertigo. In neither case are there any symptoms to justify the diagnosis that there is present any inflammatory condition of the inner ear or any intracranial disease. A noteworth feature, too, is the increase of the vertigo when these patients find themselves in crowds. Correction of refraction errors in both cases lessened the disturbances. Naturally, one suspects an hysterical or neurasthenic element. In both cases there are present abdominal disturbances. Enough has been said to illustrate my first point, viz: That the application of the vestibular tests in each case of vertigo, as it presents itself, will bring forth many interesting

and unrecorded facts and is well worth the time the tests take.

In regard to the difficulty of obtaining from the text books a clear mental picture of the disturbance worked in the various semi-circular canals as the result of the application of the various tests I have especial reference to my own experience. When the results of Barany's work were first brought to my attention and the elaborate diagrams (see Ballenger's Diseases of Ear, for example) of the semi-circular canals with the arrows pointing in every direction to show the flow and change of flow of the endolymph as the tests were varied, I found it no easy matter to clearly associate the lessons these diagrams sought to teach with the varying nystagmic movements and the past pointing of the extremities and falling of the body. Indeed, I may say, I failed to do so, because it was a matter of memory unaided by knowledge of the basic relationship of the movements of the endolymph, of the eyes and of the body and extremity movements. To be told that the nystagmus, the past pointing and the body falling always take place, under normal conditions, in the direction of the endolymph flow and that the vertigo is in the opposite direction, while true, required an effort of memory pretty much like that of remembering the dates in history or the birthdays of the members of one's family or friends. To my mental walls such dates will not adhere. There is too much of the "hay foot!" "straw foot!" in the make-up. One day, while I was submitting to the Barany test of the transverse vertical canals, on attempting to stand, I felt a distinct pull of the tendons of my ankle joint, then of my knee, then hip, body, shoulder and neck. These motions were so distinct that in spite of the vertigo and efforts to balance myself which I was experiencing they made a distinct impression on my mind. As soon as the vestibular disturbance had cleared up, I stood with my feet together and bent my head toward one side and I immediately recognized that I was calling forth in my ankle, knee, hip, body, shoulder and neck the exact movements which the turning in the Barany chair had produced.

It was now clear to my mind that every time I dropped my head toward either shoulder two things took place, the endolymph in the transverse vertical canals was thrown to the opposite direction and that every joint in my body and extremities on both sides participated in the movement, on one side relaxation, on the other fixation. It then became an easy matter to visualize the movements of the endolymph of the transverse vertical canals with the body and extremity falling and past pointing, as they are so-called. It followed as a matter of course, to see what took place when the head was bent forward and backward or revolved in the horizontal plane. Thus the movements of the endolymph in each of the three canals were seen in their relationship with their body and extremity movements.

But why the nystagmic movements of the eyes? What connection have they with the movements of the endolymph fluid and past pointing and falling? Why this association? If you will hold a mirror before your face and while looking into it turn your head from side to side, you will see that the eyes move in a direction opposite and with a rapidity equal to the movement of the head. The eyes maintain their parallelism but their movements from side to side have an evenness, a lack of jerkiness, which is altogether absent when the head is fixed and the eyes are voluntarily turned from side to side. The former movements of the eyes resemble those of a pendulum in their evenness. In this experiment the willed control of the eye muscles is entirely suppressed. It will be further noted that the pendulum movements of the eyeballs are rotary if the head is dropped to either shoulder, are in the horizontal plane if the head is revolved from side to side, and are in the anterior-posterior plane if the head be moved forward or backward. In other words, the pendulum movements are always in the direction of the movement of the endolymph. Having made this observation in regard to the ocular movements and having thus linked them up with the movement of the endolymph and the body and extremity movements and having then seen the intimate, necessary connection among them, all difficulties of visualization of the vestibular complex disturbance disappeared. In the three elements of the vestibular trinity, their relations the one with the others being clear, there arose at once the effort to obtain an equally clear conception of the nervous pathways concerned in the production of the vestibular pictures. To describe these pathways and their connections is out of place here. It is enough to say that contemplation of them brings out some inter-

esting and important facts,—among them, one of the reasons for the autonomic nerve supply to the external ocular muscles; another, the existence in the mid-brain of community centres for the reception of impulses from both the vestibular nerve terminals and the sensory nerves of the neck muscles, i. e., of two-way switches, so to speak, capable of transmitting cerebralwards impulses from both the vestibular terminals and the neck muscles, thus furnishing the brain with a double source of information as to the exact position of the head at all times. To discuss this point fully would lead us to consideration of both the functions of the cerebellum and the value of postural tone,—manifestly, subjects beyond the scope of this paper. I have ventured at the risk of boring you to give these details of how I acquired what practical knowledge I possess of the inter-relationship of the elements of the vestibular reactions. I have done so because I had so much trouble and it took me so long to master a clear, practical working knowledge of the vestibular problem.

The last phase of my paper has to do with the vestibular responses as an aid to the diagnosis of intracranial disturbances. I might say, read Dr. Jones' work, and close my paper right here; but merely reading Dr. Jones' book will not suffice. Its flat diagrams, however excellent they may be, are merely suggestive helps. They in no way draw for us actual pictures. For those of us who cannot visualize distinctly the intracranial pathways of the vestibular nerve, efforts to make use of the valuable information this book contains will prove for practical purposes futile. The more clearly the mind's eye can see these pathways and their relationship, at each point, to their adjacent structures, the more valuable becomes our knowledge. I daresay there are few of us who keep in our offices a hardened human brain and with it in our hand, attempt to see what must be the intracranial conditions which could give rise to the varying vestibular pictures our tests disclose. Until we have done this many times, until the great mid-brain cerebellar region is clear to our mind's eye, until our mental perspective can give proper correlation in size and position to the cerebellum, its peduncles, the medulla and pons and to their nuclei and tracts, we shall remain unable to interpret aright the results of our vestibular tests. To this we must add knowledge of the special tumors and the inflammatory affections which occur in the cerebello-mid-brain region, and of the physiology of the many nervous centers which are here crowded together. When our preparation is complete, the full value of Dr. Jones' work will be evident,—not only evident, but with it, as we test our cases, will come that ever-recurring mental exhilaration which is the reward of the keen exercise of our observing and reasoning powers.

One by one the secrets of the ear have been unfolded and have dropped their mysterious petals until now, in most cases, the diagnosis, line of treatment to be adopted, and prognosis are so plain that they bear the label of routine.

It may be objected, however, that the intracranial problems of the vestibular nerve belong to the brain specialist, especially to the surgeon. This may be true so far as treatment is concerned but the interpretation of the vestibular picture must always belong to the otologist, but not to him who confines his literary researches solely to text books in otology. There are many terminal vestibular pictures whose proper interpretation are possible only by those to whom otological problems are constantly presenting themselves, and the otologist alone will be able to give to them their true value in the picture presented in the presence of intracranial troubles which involve the vestibular pathways.

411 *East Franklin Street.*

ETIOLOGY, DIAGNOSIS AND TREATMENT OF CHRONIC GASTRIC AND DUODENAL ULCER.*

By P. S. SMITH, M. D., Abingdon, Va.

Paradoxical as it may appear, the stomach, figuratively speaking and in the language of laymen, is the "chief end of man." Napoleon, evidently a physiologist as well as warrior, stated that his army travelled on its stomach. It would not be far amiss to say that the success or failure of the South in 1861-65 depended in a large measure upon her quartermasters and food supply depots. Ample, suitable food and the ability to utilize it satisfactorily in the gastro-intestinal tract are the *sine qua non* of health and happiness of the individual or nation. But the subject assigned for this paper as a part of the sym-

*Read as part of the Symposium on Chronic Gastric and Duodenal Ulcer, at the meeting of the Southwestern Virginia Medical Society, Wytheville, September 13 and 14, 1922.

posium is entirely too large to spend further time with matters more or less irrelevant.

The simplest method of accomplishing this task is the conventional way, that is, by frequent references to the literature and authorities on the subject, to discuss seriatim the cause, diagnosis and treatment of chronic peptic ulcer. Another plan, however, less stereotyped in character, offers a more attractive and practical method of approach. Few patients consult us for treatment only; while the majority come complaining of a symptom, asking what is the cause of their ailment and what must be done to obtain relief. Right here is the fault inherent in much of the instruction given in many medical schools. In the absence of any original data to contribute, an effort will be made, therefore, to treat the subject from the standpoint of the problems raised in the mind of the internist when a patient, who is subsequently found to have a peptic ulcer, presents himself for advice.

The files of almost any general hospital will show numerous case records of peptic ulcer as characteristic as the following one selected at random from our summary of chronic duodenal ulcers. Only the salient facts in the case are recorded here for the sake of brevity:—

Case No. 4895, C. P., age 20, single, male, complains of upper abdominal pain off and on for the past 4½ years. It began rather suddenly. While engaged in plowing a field a stump of a tree flew up striking him violently in the pit of his stomach. He resumed work for two hours when he was forced to stop on account of pain at the site of the injury. No evidence of peritonitis, but was unable to work for a couple of days thereafter. Following this for 3 years he had periodic pain, though he was never able to work more than 30 days consecutively. During the past 1½ years the pain has been practically a daily affair. It is described as a "deep-seated hurting," at times burning in character, largely limited to the epigastrium but at times radiating through to the back. Vomiting usually relieves him, food of a simple character stops the pain promptly for an hour or two; cooking soda has been more helpful than anything tried. He is constantly hungry even though in pain. For six months he has passed small quantities of black "tarry" material from his bowel, but has never vomited blood. Has lost 30 lbs.

Examination: Teeth neglected and there is pyorrhoea; tonsils definitely infected. Abdomen shows no distention, slight diffuse spasticity, deep tenderness over the right epigastrium with slight muscle spasm.

No peristaltic waves or palpable masses.

Blood: hgbn. 85%; W. B. C. 12,200; P. 66%.

Urine: Neg.

Fractional gastric analysis gives a high per cent of free hydrochloric acid in the fasting stomach and following the Ewald meal.

Stools: No occult blood.

Gastro-intestinal X-ray study shows a constant filling defect in the first portion of the duodenum.

Operation reveals a large, chronic ulcer, with much scar tissue, induration and organized adhesions just outside the pylorus.

This case is presented not only because of its classical features, but because it introduces an interesting factor concerning the etiology of peptic ulcers. How much importance can be attached to the history of trauma here? Review of the literature reveals an astonishing divergence of opinion entertained by students of the subject. Frankly, the cause of peptic ulcer is not definitely known. Where many drugs are advised therapeutically in a given disorder, treatment is generally unsatisfactory. Where numerous, even though plausible, theories are advanced to explain the etiology of a recognized disease there is still need of further effort on the part of the research worker. Osler, in discussing the subject, mentions local trauma, lowered alkalinity of the blood, gastric hyperacidity, decreased resistance of the tissues involved from intercurrent diseases like tuberculosis, syphilis, scurvy, diabetes, etc. Virchow, at an early date suggested embolus and thrombus as pathogenic factors; neurologists lean to a lesion of the central or peripheral nervous system; endocrinologists inject their 'hormone" theory; Rosenow finds a field here to prove the tropism of bacteria; while others less scientific in their attitude talk of hot bread, condiments, etc.

Sippy, after reviewing the subject exhaustively, utilizes a proven point here and another there, and reaches a conclusion that for the present, at least, must be accepted until its fallacy is demonstrated. Logically stated, he asserts that there must be a predisposing cause resulting in localized malnutrition or

necrosis of the mucosa; given this, there must follow a secondary factor directly causing ulceration and retarding healing. Rosenow's bacterial exposition, added to Virchow's theory of embolus and thrombus formation, fulfils the first requirement; the digestive action of the gastric juice and the irritating effect of uncombined hydrochloric acid on a raw, exposed mucosa answer the question often asked why peptic ulcers do not as frequently heal spontaneously as those located elsewhere.

May not the "kick" of the offending tree stump have resulted in a temporarily lowered resistance of our patient's duodenum to the focal infection in his mouth and tonsils? If so, it is easy to follow Sippy in arguing for a bacterial embolus involving the duodenal mucosa with subsequent localized malnutrition, necrosis and ulceration in the order stated; next, nature's effort to repair the damage prevented by the corrosive action of the digestive enzymes and free hydrochloric acid. At least, it offers a picture that appeals to the imagination of the theorist and likewise commands the respect of the scientist.

The data offered in the case history given, together with the following, will suffice to bring out the cardinal diagnostic points in chronic peptic ulcer:

Case No. 6361, Mrs. C. L. B., age 45, complains of indigestion and bleeding from the stomach. For 14 years has had stomach trouble characterized by a dull, aching pain in the pit of her stomach, later of the "gnawing or hunger" type, periodic in time, at times radiating through to her back; relieved by food for 2 to 3 hours, also by soda which she takes during the night. One week ago she vomited a large quantity of "coffee-ground" material which contained blood and later passed a number of "tarry" stools.

Examination: Well nourished, but anemic in appearance. Teeth badly neglected and pus can be expressed from the gums.

Abdomen not distended, tender nor rigid, though the right rectus is slightly more spastic than the left. No masses or peristaltic waves.

Blood: hgbn. 62%; W. B. C. 12,000; P. 76%.

Stools: No occult blood.

X-ray with barium meal shows constant filling defect, or incisura, on greater curvature, prepyloric, suggesting ulcer opposite to incisura. No evidence of malignancy.

Operation: Small, indurated ulcer, gastric side of pylorus with many adhesions but no apparent stenosis.

Post-mortem statistics indicate that open or healed peptic ulcer is present in five per cent. of all adults dying from various causes. Mayo believes that this figure is too high. At any rate, its incidence is sufficiently great to demand a careful scrutiny of the patient's symptoms if we are to avoid overlooking a lesion that has fatal potentialities. Such terms as gastralgia, gastritis, nervous indigestion, hyperchlorhydria, etc., are often ill-advised. In this connection it should be stated that few clinical entities require the same degree of painstaking care in eliciting and analyzing the patient's history and symptoms, in orderly sequence, that is necessary in peptic ulcer. The stomach may endure tremendous abuse; infection of that organ and duodenum is not frequent. Hence, if by study of a given patient we can exclude extra-gastroduodenal lesions, chronic pain or distress in the epigastrium should always suggest ulcer or malignancy. On the other hand, laymen have become so familiar with the significance of peptic ulcer, and what it entails therapeutically, that a real responsibility rests upon the physician not to indict a patient on such a charge without due evidence necessary to convict. In some clinics the diagnosis is altogether too popular.

What then warrants us in making a diagnosis of chronic peptic ulcer? The two cases referred to illustrate the cardinal symptoms without which an opinion should be reserved until further investigation can remove the doubt. In both, the victim's history was practically conclusive and far outweighs the most expert physical examination. In the absence of those almost infallible guideposts,—a history of vomiting of blood and passage of "tarry" stools by a patient who is known not to have cirrhosis of the liver, malignancy, splenic or pernicious anemia,—we must elicit from the patient, without too much prompting, at least two out of three of the classical symptoms resulting from chronic ulcer. Briefly stated, they are as follows: 1. Periodic distress or pain largely localized in the epigastrium; 2. Protein food relief occurring immediately after eating and lasting from one to three hours; 3. Prompt relief of distress on taking an adequate dose of soda bicarbonate or calcined magnesia.

It must be admitted that chronic cholecys-

titis or appendicitis with their referred pain, associated with hyperchlorhydria and pylorospasm, may at times simulate so closely the above syndrome as to result in an erroneous opinion. Medicine, however, would lose much of its fascination if it could be reduced to a mathematical basis. Pity the chiropractor, while condemning him, in being limited to a single diagnosis, viz., mal-adjusted vertebrae. With him there is no possibility of error, though recently we admitted a college professor suffering from an acute perforated duodenal ulcer who had received "spinal adjustments" at the hands of one such subsequent to the perforation!

It would be most unfortunate if the writer were understood to imply that the diagnosis of peptic ulcer could invariably be made in the simple fashion suggested. Some cases remain obscure after they have passed through the entire "mill" of diagnostic investigation. Particularly should one be wary in advocating operation with such limited data. The questionnaire of the examiner should include any corroborative facts that may suggest themselves. The examination that follows must be thorough, noting any foci of infection, localized (finger-point) tenderness in the epigastrium, peristaltic waves from left to right, or the presence of a palpable mass in the region of the pylorus. If available, recourse should be made to the laboratory for occult blood examination of stools, a fractional gastric analysis for evidence of stasis, old blood, hypersecretion when the stomach is empty of food, and a free hydrochloric acid concentration above 40 or showing a tendency to rise after the three hour period following the Ewald meal. Finally, the modern radiologist can furnish helpful confirmatory data by a gastrointestinal study of the barium meal. Since all of these aids in diagnosis are not available to the average physician in many cases, he must cultivate all the more assiduously the habit of painstaking investigation of these patients as far as his facilities will permit. When the distress picture is subjected to careful analysis it is believed that most of them can be accurately diagnosed without the help of the laboratory or roentgenologist.

Ulcer symptoms, unfortunately, are at times simulated by carcinoma and syphilis of the stomach: malignancy, especially, should be thought of in every case in which a diagnosis of ulcer is made. If it can be demonstrated that the lesion is on the duodenal side of the pylorus, cancer is highly improbable. On the other hand, if there is an absence of free hydrochloric acid, and lactic acid is found, cancer must be excluded. A palpable mass, associated with the foregoing findings, is strong presumptive evidence of carcinoma. A careful search for metastases should be made and the aid of the roentgenologist requested. the blood Wassermann reaction will answer the question regarding syphilis.

The third and last case history, with the two already introduced, will serve to emphasize what need be said as to the treatment of chronic peptic ulcer:

Case No. 6130, I. G. M., age 40, male, complains of stomach trouble, stating that for 12 years he has had periodic pain of a "gnawing" or "aching" character in the pit of his stomach. Appetite is "too good"; food relieves for 2 to 3 hours; no pain upon awaking in the morning; has taken a "barrel of soda" with temporary relief; vomiting also helps him: no blood in vomitus but has passed black stools Examination shows no anemia and is essentially negative except for demonstrable dental infection and moderate tenderness over the right epigastrium with slight muscle spasm. Blood, stools and urine negative. Gastric analysis: 60 c.c. in fasting stomach and a sharp rise of free HCl during period of digestion of Ewald meal.

X-ray shows a constant filling defect of the duodenal cap. This patient was instructed regarding his diet and given alkalies; several months later he reported himself free from symptoms.

Most of the recognized diseases we see are definitely classified therapeutically as either medical or surgical. Some types of pleural empyema, toxic goitre and specific pelvic infection, for instance, may be medical today and surgical tomorrow. Chronic peptic ulcer belongs to the latter group of clinical entities. Only the inexperienced surgeon advocates operation for an uncomplicated ulcer of less than one year's duration. Furthermore, Moynihan, whose surgical judgment is universally recognized, in a paper on chronic gastric ulcer, states: "It is at least arguable that the necessity for surgical relief in many cases is due to a too perfunctory trial of medical treatment," and he advises that "a really serious attempt to treat all cases of chronic gastric

ulcer medically should be made before surgical treatment is instituted." The *routine* gastro-enterostomy has fallen into deserved disrepute, for, with a patent pylorus, food and gastric secretion continue to pass through the normal opening and the emptying time of the stomach in such cases is not hastened. And yet, no one questions the fact that a perforation, marked induration and tissue-narrowing of the pylorus, perigastric abscess, or an ulcer with beginning malignant degeneration demand surgical intervention. Nor is the removal of a demonstrable focus of infection, which is essential to proper treatment, ordinarily a matter for medical attention.

A diagnosis of peptic ulcer having been made, it is the business of the internist to determine, if possible, the location, chronicity, extent of the ulcer and the absence or presence of complications such as have been mentioned before advising treatment. What can be said of the medical care of chronic peptic ulcer? Sippy claims to relieve permanently 85% of his cases of ulcer with retention of food and secretion, demonstrating that the obstruction thus overcome results from pylorospasm or acute inflammatory swelling. The remaining 15% show tissue-narrowing and a cicatrix of the pyloric outlet and, therefore, are manifestly surgical. Such cases as require surgery should be given the benefit of medical and dietary care after operation.

The rationale of all medical treatment is based on the acceptance of the etiological factors previously stated. The digestive action of pepsin is due to its solvent or proteolytic effect on prōtein substances only when properly permeated with free acid. The exposed ulcer bed is a fertile field for such digestive action of the enzyme. Hence, only by maintaining accurate neutralization of all free hydrochloric acid during the time food and its accompanying secretion are in the stomach may the solvent action of the gastric juice be prevented and the conditions necessary for healing of the ulcer attained. Clinical relief and post-mortem examinations of treated patients dying from other causes testify to the practicability of the treatment.

Among the many workers in this field Smithies and Sippy stand out prominently. Time will not permit of a detailed discussion of the therapeutic procedures advocated by them. Briefly, Sippy's plan consists in putting the patient to bed for two or three weeks and controlling the free acidity and corrosive gastric juice by feeding him a combination of milk and cream every hour from 7 A. M. to 7 P. M. for one or two days. Later, a soft egg with cracker or bread and butter may be given once daily. As the symptoms improve the diet is gradually enlarged and varied so as to include two or three eggs, cereals, cream soups, vegetable purees, jellies, custard and other soft, digestible articles. On such a diet charts usually show a progressive increase in the patient's weight. Food alone will not maintain control of the free acidity; hence, alkalies are administered. Powders containing calcined magnesia and sodium bicarbonate alternating with others of calcium carbonate and sodium bicarbonate are given midway between feedings. Following the 7 P. M. nourishment the powders should be continued every half-hour for four or five doses, or until the stomach contains no food as determined by the stomach tube. Later, the acidity and secretion may be controlled by continuing the alkalies and spacing the feedings every two, three or four hours. The amount at each feeding should not be large, but both quantity and variety may be increased from time to time as circumstances justify. A trial, full meal may be allowed occasionally. Usually, the pain is relieved in one or two days after treatment is begun. If there is much flatulence, the carbonates are reduced and the magnesia increased; frequent stools or irritation of the colon are combated by reversing the formula. In the average case treatment should be continued for a year; some require a longer period.

Peptic ulcer with retention and stagnation of food and secretion, when not resulting from cicatrization of the pyloric outlet, is handled in much the same manner. Larger doses of alkalies and smaller feedings at first are necessary. The stomach should be washed out one-half hour after the last powder is taken; in those with a large night secretion a second lavage at midnight may be needed for a time. The patient can soon learn to do this for himself. If at any time the amount of the secretion is not large and there is little or no free acidity in such night washings, one may feel assured that the ulcer is not being subjected to the corrosive action of the gastric juice day or night; under such circumstances healing is inevitable. The author of the treat-

ment states that the co-operation of the patient is easy to secure since the relief so promptly felt by the victim from the outset more than justifies the necessary trouble and inconvenience.

It is not the writer's purpose to invite a discussion of the relative merits of surgical and medical treatment. Conditions in any given case will often solve the problem of what disposition shall be made of the patient. He may not be operable on account of complications. On the other hand, the vocation, poverty or lack of intelligence of the patient may be such as to render the medical treatment not feasible. In few conditions is there need of closer team-work on the part of the surgeon and internist; the one is the complement of the other; a spirit of mutual concessions is essential. The writer's medical life has been largely spent in a surgical "atmosphere," the energizing and life-saving properties of which no one is more appreciative. A broad view-point, unfettered by prejudices, not distorted by mental "astigmatism," and with the best interests of the patient as the determining consideration, will solve each problem as it arises.

Conclusions.

1. Peptic ulcer is a fairly common disease.
2. There is reason for the belief that many ulcers of the stomach and duodenum exist, and later heal spontaneously, without causing sufficient symptoms to command attention.
3. The cause of peptic ulcer is not definitely known. Bacterial emboli plus the corrosive action of pepsin and free hydrochloric acid are probably responsible for most cases.
4. Chronic pain or distress in the epigastrium should prompt the examiner's suspicion of ulcer or malignancy.
5. A careful history, systematically recorded, is essential to a correct diagnosis. The laboratory and X-ray should be utilized when possible.
6. Ulcer of the duodenum is more common than gastric ulcer; cancer involves the stomach primarily more frequently that the duodenum.
7. Many cases of ulcer thought to be surgical can be cured medically. All foci of infection should be removed. Patients requiring operation should later receive medical and dietary care.

George Ben Johnston Memorial Hospital.

SURGICAL TREATMENT OF CHRONIC GASTRIC AND DUODENAL ULCER.*

By ALFRED P. JONES, M. D., Roanoke, Va.

One of the most able men I have ever known used to say that every man working in any specialized branch of medical science ought to do most of his reading outside of his own specialty. The discussion of the treatment of gastric and duodenal ulcer certainly bears out the wisdom of that statement, because both surgeons and internists can learn much from each other as to the efficient management of this disease, and the best results can only be obtained by the close association and hearty co-operation of both.

Today it is not a question of medicine versus surgery but medicine with surgery in the treatment of this disease.

From the surgical standpoint we must recognize three types of ulcer:

1. The perforating ulcer.
2. The acute or early ulcer.
3. The chronic or indurated ulcer, with or without pyloric obstruction.

It is now universally recognized that the only rational treatment for perforating ulcer is immediate surgical intervention. In order to make this possible, prompt recognition of the condition is necessary. The points in diagnosis are—the sudden onset of acute abdominal pain, following a history of chronic ulcer, and the evidence of an acute peritonitis.

Moynihan has well brought out the diagnostic significance of board-like rigidity of the abdominal muscles as distinguishing this condition from gall-stone or renal colic. With smooth muscle colic your patient is restless, twisting and squirming about the bed, seeking a more comfortable position, while the patient with perforation is lying as still as possible trying to aid his abdominal muscles in splinting the injured area.

As to operation, infolding or excision of the ulcer is naturally of primary importance. Whether this be accompanied by pyloroplasty or gastro-enterostomy depends upon the patient's condition and the surgeon's preference, as there is a diversity of opinion on this particular point.

The acute or early ulcer is distinctly a medical condition and surgeons generally are recognizing that such patients should be given the test of a carefully regulated dietetic course

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of treatment under a competent internist, before an appeal to surgery is made.

Starting from the familiar fact that the taking of food gives relief to the pain of gastric ulcer, Sippy and others have devised a schedule of frequent feedings with the addition of alkalies, which will cure, at least temporarily, about ninety per cent of acute ulcer cases.

The third classification, the chronic or indurated ulcers, deals with the remaining ten per cent. who have either been resistant to medical treatment or have not been so fortunate as to receive such treatment. These cases fall distinctly into the domain of the surgeon.

The clinical difference between the two types is well illustrated by the personal experience of two of my surgical friends. One of them, after having been under weight and below par generally for three or four years, was brought up short one day by a profuse gastric hemorrhage. He consulted the best surgeon of his acquaintance, who advised him to give medical treatment a fair trial. He did and today, some ten years since, is in perfect health. The second for years recognized the fact that he had an ulcer, treated it with diet and alkalies without result, obtaining relief only after a large indurated ulcer was excised and a pyloroplasty done.

A study of the pathological picture in the acute and chronic ulcer shows us the reason for cure by medical means in the one and failure in the other.

The early or acute ulcer is seen to be merely an erosion of the mucosa, impossible to palpate through the stomach or duodenal wall, and difficult to identify even after the mucosa is exposed.

The chronic or indurated type shows a puckered scar with thickening and induration involving all the coats of the bowel and extending for a variable distance from the ulcer proper. When the mucosa is exposed, a deep crater, with hard infiltrated walls, is seen. Obviously such a lesion would be more resistant to medication than the superficial erosion, and it is in just this type of case that surgery is indicated.

How is the clinician to determine with which type he is dealing? A careful history is first in importance, then the X-ray, gastric analysis, stool and blood examinations and general physical examination. And remember that the history frequently shows that medical treatment has been already tried without success. Having decided that he has such a case to deal with, what operation should the surgeon do and why?

He is confronted with a three-fold problem. (1) The ulcer itself, shall it be excised or left? (2) Pyloric obstruction. (3) Drainage of the stomach to permit neutralization of the excessive acidity and to put the ulcer at "rest."

The question of excision of the ulcer must be decided for each case separately, depending largely on position, and this is one of the advantages of pyloroplasty in those cases where the ulcer lies close to the pylorus in either stomach or duodenum. A second reason for the excision of the ulcer is the well-recognized fact that a malignancy may develop in the base of an ulcer. When excision is impracticable, the cautery affords a valuable means for destruction of the ulcer, as advocated by Balfour.

Pyloric obstruction with consequent gastric retention, of course, demands relief which takes the form of gastro-enterostomy or pyloroplasty.

Pylorectomy is coming to play an increasing role in the treatment of ulcer, and, in the extensive, deforming ulcers of the pyloric region, certainly offers the best hope of cure, when we remember that we are also removing a potential cancer, and the differential diagnosis is frequently difficult even with a frozen section. Against pylorectomy must be mentioned the greater extent and difficulty of operation with correspondingly greater mortality.

The fact that rest of the stomach will cure an ulcer has been beautifully demonstrated by Bevan who fed a series of patients through a jejunostomy allowing nothing by mouth, and obtained healing of the ulcer. Ordinarily, we obtain this rest by pyloroplasty or gastro-enterostomy and relieve pyloric obstruction at the same time. The choice of operation depends largely on the individual case, but somewhat also upon the surgeon's preference.

At a recent medical meeting Sippy stated that he had treated hundreds of patients after gastro-enterostomies but had never treated one after a pyloroplasty. Of course, it must be remembered that the number of gastro-enterostomies that have been done is very greatly in excess of the number of pyloroplasties.

And this brings us to the post-operative treatment. By this I mean not only the immediate post-operative period, when the patient is still in the hospital and under the care of the man who operated on him, but after he goes home.

During the past year we have seen ten patients, two of our own and eight done elsewhere, who were having trouble following gastro-enterostomies. Every one of these obtained relief under a bland diet and alkalies. What more striking reminder could we have that we are not giving our ulcer patients a square deal unless we insist on strict adherence to a prescribed diet for a few months after operation?

What should this diet be? Practically a Sippy diet, which is to be gradually increased to a full diet as the patient's condition demands it.

And this brings us back to our original proposition that the surgeon and medical man must join forces in the treatment of gastric and duodenal ulcer, if we want to give the patient the best chance for permanent relief, and incidently improve our results.

Jefferson Hospital.

X-RAY PHASES OF CHRONIC GASTRIC AND DUODENAL ULCER.*

J. F. ARMENTROUT, M. D., Roanoke, Va.

The Roentgen procedure for the diagnosis of chronic gastric and duodenal ulcer has become a well-established method of obtaining objective symptoms for establishing a positive or negative diagnosis as to the presence of chronic ulcer, gastric or duodenal. The technic has been well developed in recent years and now commands the attention of the profession for diagnosis in the gastro-intestinal field.

Organic changes in the stomach or duodenum are accompanied by marked deviations from the normal outline of these organs and, on the correct interpretation of these deviations, depends the accuracy of the Roentgen diagnosis.

Spastic conditions and adhesions often produce defects of stomach or duodenum, very similar to those of ulcer, when it must be definitely determined whether the distortion present is of organic or non-organic origin. The presence of a tender-pressure point directly over and on the defects affords very good evidence but too much reliance must not be placed upon this sign. Series of plates should be made at intervals which it would be well to repeat after administration of belladonna to physiological effect. Pressure defects sometimes simulate those of ulcer origin as well as adhesions due to a chronic cholecystitis.

We also have defects due to partial filling of the duodenum, but this is usually overcome by making examinations with patients in prone position; sometimes, resort must be had to a lateral oblique position. Chronic appendicitis may reflexly cause the stomach or duodenum to assume shapes that closely simulate ulcer defects; but repeated examinations will enable the Roentgenologist to make a reasonably safe differentiation.

Besides the observation of the defect we have hour-glass phenomena, pyloric or duodenal obstruction of varying degrees to be considered of value as indirect signs of the presence of some organic lesion.

Ulcerous lesions in proximity with the cardiac orifice of the stomach are extremely difficult of detection, unless cardiac sphincter is involved, in which case ulcer may be suspected by a stricture of the cardiac sphincter, as shown by collection of opaque medium in the dilated portion of oesophagus just above the sphincter.

The writer believes it a better procedure to make fluoroscopic and radiographic examinations, repeated until decisive features are obtained, as to a positive or negative diagnosis, after which a careful clinical history may be obtained and considered. Frequently, the results of the Roentgen examination are so conclusive, that the history seems immaterial, at least to the Roentgenologist, but in no case is it good practice to ignore the history.

Though X-ray findings are convincing, they are doubly so when backed up by a very definite history.

Study your patient as well as your plates, and your work will be of increasing interest to your professional friends and win for you their confidence and respect.

While in the past few years many advances have been made in the Roentgen art, increasing greatly diagnostic accuracy, nevertheless there is yet room for improvement; and it behooves the Roentgen worker to be on the alert, to employ his best efforts to increased efficiency and accuracy in his particular line, and thereby be of the greatest possible usefulness to the profession.

432 *MacBain Building.*

*Read as part of the Symposium on Chronic Gastric and Duodenal Ulcer, at the meeting of the Southwestern Virginia Medical Society, Wytheville, September 13 and 14, 1922.

NOTES ON RECTAL SURGERY.

By E. H. TERRELL, M. D., Richmond, Va.

The terminal portion of the intestinal tract, which includes the rectum and anal canal, is affected by disease oftener than any other part of the body, with the exception of the nose and throat. Many and varied pathological conditions are to be found here and of them 85 to 90 per cent. occur in the constricted part of the gut, or within its lowest one inch.

Because of its situation and anatomical construction the anal canal is subjected to frequent injury. It is surrounded by strong muscular bands, the external and internal sphincters and levator ani. These muscles exert, at times, considerable pressure upon it in attempting to expel hard fecal masses which have collected in the rectal ampulla, immediately above it; also, puncture of its membrane may occur from the passage of sharp bodies swallowed unconsciously with the food or accidentally.

It should not be assumed, however, without just cause, that traumatism is the only etiological factor in infectious diseases of the anal canal.

The canal is covered by a transitional epithelium called muco-cutaneous tissue, which resembles in some respects both skin and mucous membrane, but has none of the resisting powers of either. Although it has a very abundant blood supply it does not seem to be able to resist or throw off infection as readily as the healthy skin or mucous membrane. Because of the contour of the canal, there is a lack of natural drainage, which accounts for the chronicity of many of the infections.

In early embryonic life a fusion takes place between the proctodeum and hind gut. As a result of this there are left several folds of mucous membrane which constitute the anal valves. The mouths of these valves look upward, and, as was noted first by Beach, in 1909, are favorable sites for the entrance of infection. At times, there seems to have been an incomplete fusion between the hind gut and proctodeum, where later a separation of the tissues takes place. In that case, a pocket or diverticulum is formed, which pathogenic organisms find a most inviting point of attack.

Just beneath the muco-cutaneous covering of the anal canal is a thin layer of fibro-cellular tissue which is of the greatest importance. This is seldom mentioned by writers on rectal diseases, but Gray's Anatomy calls attention to it. Infections which are limited to the inner surface of the fascia are the more numerous and may be termed superficial, while those that break through into the cellular tissues constitute the deeper and, usually, the more serious ones.

Correspondence

Infectious Jaundice.

195 Church Street,
New Haven, Conn.
Nov. 24, 1922.

TO THE EDITOR:

The undersigned is desirous of obtaining information regarding the prevalence of Infectious Jaundice in your State. The disease is non-reportable and information regarding its prevalence cannot, therefore, be obtained from the Boards of Health. I shall be grateful for any reports of outbreaks which your readers may care to send me.

GEORGE BLUMER, M. D.

Proceedings of Societies

MEDICAL SOCIETY OF VIRGINIA.

Financial Report of Secretary-Treasurer for 1921.

STATEMENT OF CASH RECEIPTS AND DISBURSEMENTS OF THE VIRGINIA MEDICAL MONTHLY AND MEDICAL SOCIETY OF VIRGINIA FOR THE YEAR ENDING DECEMBER 31, 1921.

RECEIPTS

Cash balance in Merchants National Bank, Richmond, Va., January 1, 1921		$ 1,209.45
VIRGINIA MEDICAL MONTHLY:		
Ordinary Revenue		
Subscriptions from members	$3,402.27	
Subscriptions from non-members	150.10	
Advertising	7,568.35	
Interest on Bank balances	33.30	
	$11,154.02	
Extraordinary Revenue		
Rent of desk space	40.00	
Net cash receipts		11,194.02
MEDICAL SOCIETY OF VIRGINIA:		
Ordinary Revenue		
Membership dues	$3,402.28	
Interest on bank balances	33.30	
	3,435.58	
Extraordinary Revenue		
Rent of desk space	40.00	
Magazine subscriptions	114.05	

Sale of exhibit space at the Lynchburg meeting of M. S. V.	364.65		
		518.70	
Physicians Legal Defense Fund			
Advance payments for the year 1922		12.00	
Net cash receipts			3,966.28
			$16,369.75

DISBURSEMENTS

VIRGINIA MEDICAL MONTHLY:

Ordinary Expenses

Preparation of Journal	$7,542.82		
Salaries	3.216.63		
Extra clerical help	17.50		
Traveling expenses	22.67		
Rent	126.00		
Janitor's service	58.49		
Light and fuel	22.57		
Phone	67.50		
Postage	287.45		
Stationery and supplies	44.90		
Miscellaneous office expenses	7.15		
		$11,413.68	
Outlay			
Office furniture		5.50	
Net cash disbursements			$11,419.18

MEDICAL SOCIETY OF VIRGINIA:

Ordinary Expenses

Salaries	$1,383.30		
Extra clerical help	208.62		
Traveling expenses	227.08		
Rent	126.00		
Janitor's service	58.51		
Light and fuel	22.56		
Phone	70.29		
Postage	229.50		
Stationery and supplies	76.32		
Printing programs, multigraphing letters, etc	351.51		
Miscellaneous office expenses	18.47		
		2,772.16	
Extraordinary Expenses			
Magazine subscriptions	139.15		
Legal expenses for prosecution of violators of the Medical Practice Act	200.00		
		339.15	
Outlay			
Office furniture		5.50	
Net cash disbursements			3,116.81
Cash balance in Merchants National Bank, Richmond, Va., December 31, 1921			1,833.76
			$16,369.75

RICHMOND, VA., *October* 28, 1922.

This is to certify that I have examined the books and records of the Medical Society of Virginia, showing the cash receipts and disbursements of the Society from January 1, 1921, to December 31, 1921, inclusive, and find them to be correct, as shown in this statement, and that the cash balances in the Merchants National Bank, Richmond, Virginia, both at the beginning and end of the year, have been verified by statements from that bank.

The books and records in the business office of the Society are properly and efficiently kept in order, and the system now in use will answer all requirements and give such information as may be desired.

L. B. EDWARDS.

STATE OF VIRGINIA,
CITY OF RICHMOND, TO-WIT:

This day personally appeared before me, F. E. Partlow, a Notary Public, in and for the City, in the State aforesaid, L. B. Edwards, who by me being duly sworn according to law, deposes and says that the facts set forth in the above statement are true and correct to the best of his knowledge and belief, and acknowledges the signature attached thereto to be his own.

Subscribed and sworn to before me this 28th day of October, 1922.

My commission expires March 20th, 1923.

F. E. PARTLOW,
Notary Public.

Report of Meeting of Members of Executive Council, Legislative Committee, State Board of Medical Examiners, and Members of the Medical Society of Virginia in the General Assembly.

FEBRUARY 1, 1922.

PRESENT: Drs. E. C. S. Taliaferro, Paul Howle, J. W. Preston, H. U. Stephenson, R. A. Moore, F. H. Smith, J. Bolling Jones, Lawrence T. Price (by appointment in place of absent member of Council), P. St. L. Moncure, J. Fulmer Bright, W. W. Wilkinson, J. C. Flippin, Israel Brown, and Thomas G. Hardy.

Dr. Taliaferro was elected chairman of this meeting.

The chairman of the Legislative Committee, Dr. Stephenson, stated the purpose of the meeting: To consider the status of pending bills in the state legislature which affect the practice of medicine, the regulation of drugless healers, with particular reference to the bill sponsored by the chiropractors which, if enacted, will remove that cult from the control of the State Board of Examiners.

It was brought to the attention of this committee that the present General Assembly would not consider favorably new legislation affecting the practice of medicine and that it was probably useless for the medical profession to sponsor any restrictive legislation.

MOVED: That it was the sense of this meeting that no bills be sponsored by the Medical Society of Virginia or the State Board of Medical Examiners changing the present Medical Practice Act, provided, no bill be introduced by the irregular cults which is deemed detrimental to the public welfare.

The following substitute for the above was offered and unanimously adopted:

That the whole matter be left with the Legislative Committee acting jointly with the State Health Commissioner and other health authorities with power to act.

This joint committee having adjourned, the Executive Council was called together and, with Dr. Paul Howle, Chairman, presiding,

Moved and carried unanimously: That the Executive Council approve the above agreement. The Chairman of the Legislative Committee, Dr. Stephenson, presented his report accompanied by a statement showing his expenses in Richmond during the two months' session of the General Assembly.

Moved and adopted: That the Secretary-Treasurer put at the disposal of the Chairman of the Legislative Committee $300.00 or so much thereof as may be necessary to cover the expenses of the Legislative Committee.

Adjourned.

Meeting of Executive Council.

JUNE 17TH, 1922.

PRESENT: Drs. Paul Howle, Chairman, Garnett Nelson, Clerk, F. H. Smith, R. L. Williams, E. C. S. Taliaferro (in place of absent member). Constitutional quorum for transaction of business before Council found present. Moved and adopted: That the date of the 1922 meeting of the Medical Society of Virginia be fixed for October 31st, November 1, 2 and 3.

Moved and adopted: That program for this meeting as submitted by the Publication Committee be accepted with the addition of a paper on the "Acute Abdomen," the Publication Committee with Dr. F. H. Smith to select the leader.

Moved and adopted: That the Publication Committee be instructed to investigate the matter of publishing a consolidated medical journal jointly with other medical societies in nearby states.

Moved and adopted: That Drs. Howle and Nelson be authorized to employ a competent accountant to audit the books of the Secretary-Treasurer.

Moved and adopted: That the Secretary-Treasurer be instructed to use all of the provisions of the constitution and by-laws in his efforts to collect accounts from members in arrears.

The Secretary-Treasurer was instructed to report to the meeting in Norfolk concerning the activities of the state health officials in publicly advertising pay clinics in various parts of the state.

The Secretary-Treasurer was instructed to refer to the Chairman of the Judiciary Committee an advertisement of a hospital claiming to cure cancers and which contained the signed endorsement of a member of the Medical Society of Virginia.

Adjourned.

(To be continued.)

Richmond Surgical Society.

Reported by Mark W. Peyser, M. D.

November 7, 1922.

Dr. Paul W. Howle, President, in the chair.

Dr. W. W. Dunn reported a case of intracranial hemorrhage in the new-born. The child was delivered by forceps, in March, 1922, labor being dry and the pains having ceased. Presentation was occipito-posterior. There was no apparent injury to the head, but a large-sized hematoma due to prolonged labor, was found. The child was well-developed, but it had a death-like pallor, due, he thought, to intracranial hemorrhage. Examination showed no other apparent abnormality. The mother's pelvis was roomy.

On the following day it was reported that the baby had cried all night. Its temperature was 100°F., pulse 100, the cry a peculiar one. There was difficulty in nursing. On the second day, the temperature was the same, crying had ceased, and the child nursed well that day and the next. On the 4th day, convulsions were reported to have occurred; the temperature was 104°. There was no evidence of paralysis, but considering that there must be intracranial hemorrhage, he called in Drs. McGuire Newton and John Dunn who concurred in his opinion. The child was removed to a hospital, repeated convulsions occurring on the way. Decompression was done on the right side. A hemorrhage of about one-half ounce was found pressing on the right lower temporal lobe and extending to the base. The blood was washed away with saline solution, and the wound closed. Death ensued in four or five hours.

A large number of these cases is being demonstrated postmortem. Two per cent of children die of hemorrhage in the first four days after birth; and it is claimed that many of the cases of spastic paralysis are due to it. He believes that in this case the child's life could have been saved if operation had been done within the first twenty-four hours. The symptoms of interest are the increased temperature, the peculiar cry and the inability to nurse during the first twenty-four hours. He was led off by the improvement in nursing. Answering a question by Dr. Geisinger, whether or not he had seen anything in the literature of the subject on the mortality of operation, he replied that he had not, being more interested in looking up the subject of diagnosis. Cushing, two or three years ago, claimed to have saved life in two or three of the cases.

Dr. W. Lowndes Peple reported *a case of gas gangrene*, as follows: The patient, a negro man, aged about 30 years, was referred to Dr. Peple's clinic at St. Philips Hospital several weeks ago. A week prior to admission, a tree had fallen on his arm and fractured the humerus at about its middle. The patient stated most positively that there was no open wound or break in the skin. His doctor set the fracture, but being taken ill later, another doctor was called in on about the 7th day and sent him to the hospital.

When seen, the hand, forearm and arm were

tremendously swelled and black to the axilla. The skin was broken, and a foul-smelling serosaneous discharge was oozing from the whole limb. Crepitation could be felt over the right pectoral region and as high in the neck as the thyroid cartilage. The temperature was 102° F., and pulse about 110. His general appearance, strange to say, was remarkably good.

A high Guillotine amputation was done, leaving about one and one-half inches of the humerus, and severing skin, muscles and bone all on the same level so as to leave no flaps or crevices. The gas in the fascial planes was under great pressure, escaping forcefully as the knife cut through. Several diseased muscles were dissected out until healthy tissue was reached. Following the teaching that an oxidizing agent should be used in these cases, gauze saturated with apinol was packed over the wound, and this dressing was used continuously throughout the entire time of convalescence. In four or five days, the gas had disappeared from over the neck and chest. In ten days, under local anesthesia, the bone was shortened and the margins of the wound were brought over flap-wise. The patient at no time was seriously ill, and made an uneventful recovery.

The Welch bacillus was found in abundance in smears, and pure cultures were obtained.

In concluding, Dr. Peple reported a case of Dr. LaRoque's of gas gangrene with amputation and recovery.

DISCUSSION.

DR. HOWLE said that he saw Dr. Peple's patient before operation, and the condition of the arm was so horrible that he did not think recovery possible.

DR. J. S. HORSLEY asked Dr. Peple his opinion of Bull's antitoxin in these cases. He has had two of them, recovery ensuing in one. The principles of treatment outlined appeal to one; and the report brings up the idea of Dr. McGuire, namely, the benefit of calling other surgeons in rare cases to witness the operation.

DR. FRAVEL asked Dr. Peple to tell something of gas gangrene as seen in France. The cases Dr. Fravel saw in New York were fatal; but those seen in France were like the one reported tonight.

DR. PEPLE, concluding the discussion, said in answer to various questions: Protective sera were tried out by the English, French and American forces in the late war, but not being considered effective, their use was discontinued. The underlying principles of treatment were (1) Guillotine amputation; (2) wide excision of diseased tissues, leaving no flaps, pockets or crevices; (3) perfect drainage to be obtained and maintained; (4) application of some oxidizing agent. It must be remembered that gas penetrates considerably higher in the tissues than do the bacteria. When too much time has not been lost and there has not been too much mangling of the tissues, the percentage of recoveries is high.

Dr. M. E. Nuckols read a paper entitled *Cancer of the Colon with Obstruction.—Report of Cases.*

DISCUSSION.

DR. STUART MCGUIRE said the paper is conservative and the position taken a proper one. He does not believe in performing resections on the aged. Only this morning he saw a patient who had had a colostomy done by the Mayos, and who was using a very ingenious apparatus consisting of a flat enameled dish held in position by straps improvised from a pair of suspenders. The pan is filled with toilet paper; and by means of the contrivance the patient avoids soiling himself.

Dr. McGuire reported the following cases now in his hospital: Case I was that of a woman operated upon three weeks ago. There was a napkin-ring obstruction. Operation was easy, the diameter on both sides of the growth being the same. He thought that the anastomosis he affected was a good one, and closed the wound without drainage. Five days later, a lump was noticed in the upper end of the wound through which, shortly after, feces passed. In a week, however, complete healing occurred and the patient is now ready to return home. How the transverse colon, which was left free, opened up in the wound he does not know.

Case II was one of obstruction at the splenic flexure for which there had been two previous operations. In separating the adhesions the large bowel was badly torn. Efforts at suturing being unsatisfactory, a stab-wound was made in the loin and drainage was inserted to the seat of injury. A fistula formed and feces discharged through the stab-wound for a week, but it is now healed and defecation occurs naturally.

Where there is obstruction and the proximal end of the bowel is larger than the distal end, anastomosis is almost certain to fail, and the Mikulicz operation would better be done. This operation consists of bringing the affected loop of bowel out of the wound, fastening it to the skin and cutting it off flush with the abdominal wall and, later, restoring continuity by another operation. It is a life-saving operation but convalescence is prolonged and tedious. Some operators advise side-to-side, others end-to-end, anastomosis; but in all bowel resections the advice of Dr. Horsley should be remembered, namely, the mesentery should be

ligated and divided before opening the lumen of the bowel, thus minimizing the danger of infection.

Dr. Horsley said he has less trouble in operating in these cases when he takes out the colon on the right side. It is well known that fecal fistulae are apt to occur in resection of the transverse colon or of the sigmoid. He has now on hand a case like the first one reported by Dr. McGuire. Here we have originally not a leakage but an abscess which breaks down the stitches, the escape of fecal matter being a result of this and not due primarily to giving way of the sutures.

In performing resection of the sigmoid, he does an end-to-end anastomosis. In the case of a man with solitary ulcer, hiccoughing occurred, the wound broke down, and the bowel movement came through the wound. Upon attempting to make closure, the patient died suddenly, two days later, after suffering much pain. Upon postmortem, the abdomen was found to be full of fecal matter.

No matter where the resection is done, it is best to make an enterostomy in the terminal ileum. Take a medium-sized catheter with two holes in the end and two in the middle. Incise according to the principle of Coffey to the mucosa, and insert the tube into the rectum through the incision. This puts the bowel at rest, and has the further advantage of not producing the irritation that would be caused by inserting a stiff tube through the rectum into the sigmoid. Ten days later, an injection of mineral oil is given, the tube is removed, and there is, usually, no leakage of feces.

Dr. Peple said that the apparent ease with which large-bowel surgery was done in the Mayo clinic was due to a perfected technique and the use of long incisions. He had noticed that Crile, in similar operations, made free use of iodoform water in completing the peritoneal toilet, the solution being made by soaking and squeezing iodoform gauze in warm water. Dr. Crile said that this was similar in its effects to the bismuth-iodoform paste which was packed in the wounds of soldiers undergoing transportation. It retarded bacterial growth and kept the wounds clean.

We must always bear in mind, when resecting the colon, that we are dealing with the colon bacillus, and that serious wound infections are far more prone to occur than when we open the canal higher up.

It was moved, seconded and ordered that the minutes of the society be published in the VIRGINIA MEDICAL MONTHLY.

The Piedmont Medical Society

Held its semi-annual meeting in Charlottesville, November 25, with an attendance of about sixty. Several interesting papers were read and in the evening a banquet was enjoyed at Blue Ridge Sanatorium, after which the program was continued. It was decided to enlarge the territory of the Society so as to include parts of Culpeper, Madison and Greene Counties, and to apply to the Executive Council of the Medical Society of Virginia for a charter as a component society of the State Society.

Dr. W. D. Macon, Charlottesville, is president, and Dr. Lewis Holladay, Orange, secretary-treasurer of the Society.

The Mecklenburg County Medical Society

Held its last meeting at the home of Dr. G. H. Carter, in Boydton, at which time the subject of "Infectious Diseases" was discussed. Dr. Carter was elected to represent the Society in the House of Delegates at the Norfolk meeting of the State Society, and Dr. A. T. Finch was chosen as alternate. At the annual election of officers Dr. W. W. Wilkinson, of La Crosse, was elected president, and Dr. H. M. Snead, of South Hill, secretary, for the ensuing year.

The Raleigh County (W. Va.) Medical Society

Held its regular monthly meeting at the "Spinning Wheel," Beckley, Thursday evening, November 9th, when a very interesting program was rendered and a delicious dinner enjoyed by the forty-two physicians present. After the regular routine business was disposed of, the Secretary-Treasurer submitted his annual report which was ordered adopted. Dr. J. E. Coleman was selected to represent the society in Morgantown, November 30th, when several state officials of the State Association will be present to work out some details for the annual meeting of the association to be held in Beckley next June.

The following officers were elected to serve during 1923: Dr. A. H. Grigg, Beckley, President; Dr. W. W. Hume, Beckley, Vice-President; Dr. G. P. Daniel, Glen Daniel, Vice-President; Dr. Charles S. Smith, Beckley, was re-elected Secretary-Treasurer.

The following visitors appeared on the program. Drs. C. E. Gabel, of Charleston, A. S. Jones, of Huntington, and H. G. Steele, of Bluefield. Dr. O. B. Lynch, of Beckley, in a short talk discussed some phases of practice among children, emphasizing especially the question of adequate nutrition both in infancy and later childhood. He expressed the opinion that doctors as a rule pay too much attention to drug therapy and too little attention to nutrition; that babies are too often weaned because of a belief that breast milk does not agree. He condemned artificial feeding by can directions and pointed to some of the dangers of such practice. He especially deprecated the use of sweetened condensed milk of which Eagle brand is a type. He also called attention to the importance of correct posture in children. He stated that pyelitis and otitis media are too frequently overlooked. He urged physicians to teach parents that diphtheria is largely a preventable disease by the use of toxin-antitoxin. In conclusion, he expressed the desire that all physicians strive by educational means to reduce the incidence of sickness and death among children.

Just prior to the meeting, the executive committee which has charge of all plans for the state meeting next year held a meeting and discussed many plans, and authorized our delegate to Morgantown to act in our behalf and urge that we have the best scientific program in the history of the association. The committee is highly enthusiastic and is leaving nothing undone for the pleasure of the many doctors who will be our guests next June.

CHARLES S. SMITH, *Sec'y.*

The Truth About Medicine

During October, the following articles have been accepted by the Council on Pharmacy and Chemistry for inclusion in New and Nonofficial Remedies:

Lederle Antitoxin Laboratories:
Diphtheria Toxin-Antitoxin (0.1L+)

H. A. Metz Laboratories, Inc.:
Alumnol

H. K. Mulford Company:
Hay Fever Timothy Pollen Extract-Mulford

Parke, Davis and Company:
Normal Horse Serum—P. D. & Co.
Rabies Vaccine (Cumming)—P. D. & Co.

E. R. Squibb and Sons:
Acne Vaccine
Colon Vaccine-Squibb
Gonococcus Vaccine
Meningococcus Vaccine
Normal Horse Serum
Pertussis Vaccine, Curative
Pertussis Vaccine, Immunizing
Purified Diphtheria Antitoxin (Anti-diphtheric Globulin)
Pneumococcus Vaccine
Staphylococcus Vaccine
Stachylo-Acne Vaccine
Streptococcus Vaccine
Tetanus Antitoxin Purified
Typhoid Vaccine
Typhoid Vaccine Combined, Immunizing

NEW AND NONOFFICIAL REMEDIES.

Hayfever Timothy Pollen Extract-Mulford.—The liquid is obtained by extracting the proteins from the pollen of timothy. For a discussion of actions, uses and dosage, see the article on Pollen and Epidermal Extracts Preparations and Biologically Reactive Food Proteins, New and Nonofficial Remedies 1922, p. 232. This preparation is marketed in packages containing fifteen consecutive doses for a complete treatment and also in packages containing partial treatments only. H. K. Mulford Co., Philadelphia.

Purified Diphtheria Antitoxin (Antidiphtheric Globulin).—Concentrated diphtheria antitoxin (New and Nonofficial Remedies, 1922, p. 280) is marketed in syringe containers of 1,000 units and in syringe containers of, respectively, 3,000, 5,000, 10,000 and 20,000 units. E. R. Squibb and Sons, New York.

Normal Horse Serum.—This product (New and Non official Remedies, 1922, p. 278) is also marketed in packages of one 10 C.c. syringe. E. R. Squibb & Sons, New York. (Jour. A. M. A. Oct. 21, 1922, p. 1427.)

Novocain Base.—Para-amino-benzoxydiethylaminoethane. The base contained in procaine. The action and uses of novocaine base are the same as those of procaine (New and Nonofficial Remedies, 1922, p. 36), but it is soluble in fixed oils. H. A. Metz Laboratories Inc., New York.

Novocain Nitrate.—A brand of procaine nitrate-N. N. R. (New and Nonofficial Remedies, 1922, p. 37). It has the actions and uses of procaine, but is compatible with silver salts. H. A. Metz Laboratories Inc., New York.

Diphtheria Toxin-Antitoxin Mixture (O.1L+).—A diphtheria toxin-antitoxin mixture (New and Nonofficial Remedies, 1922, p. 282) containing 0.1 lethal dose of diphtheria toxin neutralized with the required amount of diphtheria antitoxin. Marketed in packages of three vials, each containing 1 C.c.; also in packages of thirty vials, each containing 1 C.c. Lederle Antitoxin Laboratories, New York.

Acne Vaccine.—Acne bacillus vaccine (New and Nonofficial Remedies, 1922, p. 298) is marketed in packages of four syringes containing respectively 50, 100, 250 and 500 million killed bacilli; in packages of four ampules containing, respectively 50, 100, 250 and 500 million killed bacilli (with a syringe); in vials of 5 C.c., 10 C.c., and 20 C.c., each cubic centimeter containing 1,000 million killed bacilli. E. R. Squibb and Sons, New York.

Gonococcus Vaccine.—This product (New and Nonofficial Remedies, 1922, p. 301) is marketed in packages of four syringes containing, respectively, 100, 250, 500 and 1,000 million killed gonococci; in packages of four ampules containing, respectively, 100, 250, 500 and

1,000 million killed gonococci (with a syringe); in vials of 5 C.c., 10 C.c., and 20 C.c., each cubic centimeter containing 1,000 million killed gonococci. E. R. Squibb and Sons, New York.

Meningococcus Vaccine, Curative.—Meningococcus vaccine (New and Nonofficial Remedies, 1922, p. 302) is marketed in packages of four syringes containing, respectively, 100, 250, 500 and 1,000 million killed meningococci; in packages of four ampules containing, respectively, 100, 250, 500 and 1,000 million killed meningococci (with a syringe); and in vials of 5 C.c., 10 C.c. and 20 C.c., each cubic centimeter containing 1,000 million killed meningococci. E. R. Squibb and Sons, New York.

Pertussis Vaccine, Curative.—Pertussis bacillus vaccine (New and Nonofficial Remedies, 1922, p. 303) is marketed in packages of four syringes containing, respectively, 100, 250, 500 and 1,000 million killed bacilli; in packages of four ampules containing, respectively, 100, 250, 500 and 1,000 million killed bacilli (with syringe); and in vials of 5 C.c., 10 C.c., and 20 C.c., each cubic centimeter containing 2,000 million killed bacilli. E. R. Squibb and Sons, New York.

Pertussis Vaccine, Immunizing.—Pertussis bacillus vaccine (See New and Nonofficial Remedies, 1922, p. 303) is marketed in packages of three syringes containing, respectively, 500, 1,000 and 1,000 million killed bacilli; in packages of three ampules containing respectively, 500, 1,000 and 1,000 million killed bacilli (with a syringe). E. R. Squibb and Sons, New York.

Pneumococcus Vaccine.—This product (New and Nonofficial Remedies, 1922, p. 304) is a suspension of killed pneumococci Types I, II, III and Group IV in equal proportions. Marketed in packages of four syringes containing, respectively, 100, 250, 500 and 1,000 million killed pneumococci; in packages of four ampules containing, respectively, 100, 250, 500 and 1,000 million killed pneumococci (with syringe); and in vials of 5 C.c., 10 C.c. and 20 C.c., each cubic centimeter containing 5,000 million killed pneumococci. E. R. Squibb and Sons, New York. (Jour. A. M. A., Oct. 28, 1922, p. 1519.)

Propaganda for Reform.

Spahlinger's Treatment for Tuberculosis.—Sphalinger, according to reports, was a lawyer who abandoned his profession for research work. He appears now to be connected with the Bacterio-Therapeutic Institute, Geneva. According to an article by Spahlinger, the treatment utilized either one or both of two therapeutic principles depending on the nature of the infection. In acute cases, passive immunization with special serums is used. In chronic afebrile pulmonary cases, in nonpulmonary, and in cases "predisposed to" tuberculosis, active immunization with special antigens is employed. No definite information in regard to the prepartion of the product is given. Reports that the British Red Cross is to purchase the treatment are unconfirmed. Reports that the Rockefeller Institute had made an offer to secure the rights for the product in the U. S. proved unfounded. The exact nature of the Spahlinger treatment does not appear to have been divulged, the treatment is in the experimental stage and the reported results lack confirmation. (Journ. A. M. A., Oct. 7, 1922, p. 1264.)

Radioactivity of Waters.—Twenty-five years ago various mineral springs and waters were claimed to have therapeutic virtues because of their lithium content. Today we know that the amount of lithium in natural waters is insignificant, and that lithium is of no therapeutic value anyway. At the present time, many mineral waters are exploited because of their asserted content of radium. However, the rationale of the internal administration of radium is being doubted. Also, relative traces of radio-active substances are practically valueless and the Council on Pharmacy and Chemistry will not accept any radium solution for internal use the dosage of which is less than two micrograms each day or any radium emanation generator which yields less than two microcuries emanation each twenty-four hours. The probable value of radioactive mineral waters may be judged when it is known that it would be necessary to consume 2,810 gallons daily of the water yielding the largest quantity of temporary radio activity in order to obtain the minimum therapeutic dose of two microcuries emanation and that the best water available as regards radium content would require the administration of 1,957 gallons per day in order to obtain 2 micrograms of radium. (Jour. A. M. A., Oct. 14, 1922, p. 1339.)

The Clinical Field of Yeast Preparations.—In March, 1921, the Council on Pharmacy and Chemistry requested its Committee on Therapeutic Research to determine the advisability of undertaking a clinical study of the usefulness in therapy of yeast preparations. Accordingly the chairman of that committee drew up a provisional plan which proposed to utilize the easily observable phenomena of growth, appetite and laxative effect as cumulative indices of all actions and to record this under a variety of normal and pathologic conditions. The plan was submitted to the committee and to others for an opinion. In consideration of the replies received and the unfavorable results published by A. L. Daniels and by A. F. Hess the chairman of the committee recommended that the study be not inaugurated. The chairman reported that he had come to these conclusions: 1. Apart from the occasional imported cases of beriberi vitamin deficiency is not a recognized or diagnosable clinical entity in this country. 2. With ordinary diet yeast does not have any effect on growth, even of babies and children. 3. The one effect of yeast that has been definitely established is the laxative effect. This may be useful in chronic constipation but no direct method of study is at present available for determining its advantages or disadvantages in comparison with other laxatives. After considering the recommendations of the Research Committee, the Council for the present decided against an investigation into the problematic usefulness of yeast as a therapeutic agent. (Jour. A. M. A. Oct. 14, 1922, p. 1354.)

A Pancreatic Hormone in Diabetes. Since the discovery of the important role of the pancreas in carbohydrate metabolism in the body there have been many attempts to supply the missing "regulator" of sugar combustion and attention has naturally been centered on the pancreas in this connection. Significant results have been secured in the Department of Physiology at the University of Toronto by J. J. R. Macleod and his collaborators. An alcoholic extract of pancreas has been prepared which apparently enabled the diabetic animal and man to metabolize sugar better. The investigators are wisely withholding the product from general use until its value is definitely established. (Jour. A. M. A. Oct. 21, 1922, p. 1428.)

Typhoid Vaccination by Mouth.—Besredka has proposed vaccination against typhoid by mouth. His vaccine consists of a pill of bile and a tablet containing a mixture of heat-killed typhoid and paratyphoid bacilli. These are taken three mornings in succession. It is for the future to determine whether or not the method has value. (Jour. A. M. A. Oct. 21, 1922, p. 1446.)

The Reactions of Boston to the "Reactions" of Abrams.—Abrams gave a clinical demonstration of his methods in the laboratory of one of his disciples in Boston. Abrams refused to submit the method, it is said, to any test offered, but confined himself to demonstrating the presence of lesions the existence of which

could be proved only by postmortem examination. A member of the staff of the Boston Medical and Surgical Journal, a man in perfect health, was selected for experiment. By his diagnostic methods Abrams discovered in this healthy individual a streptococcus infection, tuberculosis of the intestinal tract, congenital syphilis and intestinal sarcoma. Otherwise the man was all right. It is understood that the volunteer inconsiderately refused to submit to a postmortem examination. (Jour. A. M. A. Oct. 28, 1922, p. 1524.)

Book Announcements

Physiology and Biochemistry in Modern Medicine. By J. J. R. MACLEOD, M. B., Professor of Physiology, University of Toronto. Assisted by ROY G. PEARCE, A. C. REDFIELD, and N. B. TAYLOR, and by others. Fourth Edition. St. Louis. C. V. Mosby Company. 1922. 8vo. 992 pages, with 243 illustrations, including 9 plates in color. Cloth. $11.00.

Diseases of Women. By HARRY STURGEON CROSSEN, M. D., F. A. C. S., Clinical Professor of Gynecology, Washington University Medical School, and Gynecologist in chief to Barnes Hospital and Washington University Dispensary, etc. Fifth Edition, Revised and Enlarged. St. Louis. C. V. Mosby Company. 1922. 8vo. 1005 pages, with 934 engravings, including one color plate. Cloth. Price $10.00.

Physical Diagnosis. By W. D. ROSE, M. D., Lecturer on Physical Diagnosis and Associate Professor of Medicine, University of Arkansas. Third Edition. St. Louis. C. V. Mosby Company. 1922. 8vo. Cloth. 755 pages. Price $8.50.

Practical Organotherapy. The Internal Secretions in General Practice. By HENRY R. HARROWER, M. D., F. R. S. M. (Lond.) Third Edition. Re-written and enlarged. 1922. The Harrower Laboratory, Glendale, Calif. 8vo. 416 pages. Cloth. Price, $1 net.

It may as well be said at the outset that this is a house-organ in book form, a catalogue and price-list; and, yet, it will not do to "let it go at that."

The author takes up, first, the basis of organotherapy, and, in order, pluriglandular formulas; the diagnosis of internal secretory disorders; every-day organotherapy, in which applications are made of the statements set forth in the preceding section; and endocrine queries and answers; closing with an appendix and index.

Wherever possible, and the possibilities are many, the author's formulas and books (price mentioned) are recommended.

In defending the pluriglandular theory, it is written that "it is not difficult to understand that a general influence for harm—toxic, nutritional or emotional—hardly can be expected to limit its effects to a single small part of the organism. A severe toxemia such as we find in pneumonia, typhoid fever, intestinal stasis or poisoning with alcohol, morphine or other drugs, deranges the functions of the body as a whole, although in one instance a certain part of it, say the liver, may be more obviously disordered than another. This applies equally to the endocrine glands, and the writer has frequently said with emphasis that 'there never was a uniglandular endocrine disorder.'"

The causes of failure with organotherapy are set down as due to their use in long-standing and advanced cases in which other measures have been tried repeatedly and have failed; inactive preparations and unresponsive organisms where the re-education of the worn-out endocrine glands is no small task; too short a period, or periods of treatment; the use of single instead of pluriglandular, preparations because "it is not possible for a single endocrine organ to be affected slightly or seriously, without reflex (hormonic) effects upon others of the allied organs"; the expectation of cure in cases generally conceded to be incurable; and, finally, most important, an incomplete diagnosis.

The author says he has made no attempt to explain the "why" and the "how," but that "here is offered the 'real meat'—the boiled-down essentials of a subject which, according to Leonard Williams (London), 'already unfolds before the astonished view of the seeing eye, a land of promise beside which the discoveries of Lister and Pasteur are destined to pale into honorable insignificance.'"

There is no doubt that the book is of value whatever one may think of its "reason for being."—M. W. P.

The Female Impersonators. A Sequel to the Autobiography of an Androgyne and an account of some of the author's experiences during his six years' career as instinctive female impersonator in New York's Underworld; together with the life stories of androgyne associates and an outline of his subsequently acquired knowledge of kindred phenomena of human character and psychology. By RALPH WERTHER—JENNIE JUNE ("Earl Lind"). Author also of "The Riddle of the Underworld." Edited with introduction by ALFRED W. HERZOG, Ph. B., A. M., M. D., Member of

the New York and the New Jersey Bar: Editor of the Medico-Legal Journal, New York. The Medico-Legal Journal. 1922. Cloth. xii and 295 pages, with 19 illustrations. Price $3.00, including postage within United States.

The Propaganda for Reform in Proprietary Medicines Vol. 2, 1922. Containing Reports of the Council on Pharmacy and Chemistry and contributions from the A. M. A. Chemical Laboratory and from The Journal of the American Medical Association. Cloth. Price, $2.00. Pp. 603 with illustrations. Chicago: American Medical Association, 1922.

The present book is the second volume of the "Propaganda for Reform in Proprietary Medicines." The first volume ran through nine editions. The ninth edition contained (1) the most important reports of the Council on Pharmacy and Chemistry, (2) the reports of the A. M. A. Chemical Laboratory, and (3) those articles from *The Journal of the American Medical Association* which deal with the problems of proprietaryship in medicine and the furtherance of rational drug therapy. All of this material covered a period prior to 1917.

The present (second) volume contains similar material covering the period from January, 1917, to April, 1922, inclusive. Like Volume 1, this volume is divided into four parts: *Reports of the Council on Pharmacy and Chemistry; Reports of the A. M. A. Chemical Laboratory; Contributions from the Journal: Proprietary Products; Contributions from The Journals Miscellany.*

A comparison of the material that has appeared in Volume 1 with that which appears in this volume will reveal the changing conditions in the proprietary medicine field. The present volume will also be found of interest in its portrayal of the changed conditions in proprietary medicines brought about by the World War.

This book is not only valuable for the information it contains, but it is also interesting. It makes clear the work of the Council on Pharmacy and Chemistry, the A. M. A. Chemical Laboratory and *The Journal of the American Medical Association* in their several capacities as servants to the medical profession and as champions of rational medicine. The book should be in every physician's library, and more than that, should be within reach for convenient reference.

"Feeding the New Family."

The State Bureau of Vital Statistics has just issued an illustrated booklet, under the above caption, which is to be sent to the newly married as a companion booklet to the "New Family" published two years ago.

This booklet, though written in popular style, contains the result of the latest investigations in nutrition. It calls the special attention of the expectant mother to the importance of a prenatal diet composed largely of milk and leafy vegetables, for the lime and other material needed for the tooth and bone formation of the child, and to fit her for nursing it. Women are warned against midwives.

Richmond's 1921 Health Report.

The Bureau of Health of the Department of Public Welfare of Richmond has just issued its 1921 annual report, which shows that excellent work is being done by those in charge. The death rate for 1921 was 14.6 per 1,000 population, which is the lowest rate ever recorded in this city. The average age of all persons dying during that year was 40 years, which shows an increase in average age at death of nearly five years since 1911. The death rates from practically all the more important causes of death were lower in 1921 than in 1920. Cancer was the only one of the chronic diseases which showed an increase during the year.

Vital Statistics for Virginia in 1921.

The death rate for the whole state of Virginia during 1921 was 12.15 per 1,000 population, which shows a decrease as compared with 1920. There were 180 suicides, or 53 more than in 1920. There were 1,604 deaths from all forms of accident. Of these, 140 were killed in automobile accidents, which is 43 more than in 1920; 202 died from burns, 149 from drowning, and 319 were homicides. The tuberculosis death rate showed a decrease and the typhoid fever rate a slight increase over the previous year.

Colorado Takes the Right Step.

It is announced that Colorado people have voted against antivivisection, those favoring antivivisection being outnumbered by about six to one. In behalf of science and in the interest of humanity, Colorado is to be congratulated and thanked for this right step in the right direction.

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Editorial

Deterrents to the Advancement of Clinical Medicine.

That was a well drawn indictment of contemporary deterrents to the progress of clinical medicine, made by Sydney R. Miller, Johns Hopkins University, in his presidential address at the sixth annual session of the American Congress on Internal Medicine, held in Rochester, Minnesota, April 5th, 1922.

Following an era of structural pathology, he observes that medicine is now under the influence of a scientific drift which abounds with a multitude of laboratory tests as the result of the study of function. This era of the study and testing of function is crowded with innovations and inventions for the examination of the organs: this influx of new methods is associated with, if not resulting from, a decided increase of specialists and specialties. These influences and factors, occurring in the midst of professional progress of the last few decades, are really deterrents to medical progress. The elaboration of examinations by laboratory investigations and by special methods of many sorts is tending to overwhelm the art rather than advance and improve it. But the usefulness and advantages of essential and thoughtfully selected examinations by the laboratory specialist can not be gainsaid. It is an unquestioned fact that clinical practice and laboratory study must go hand in hand if medical practice is to improve. This, however, does not mean that the practice of the needless laboratory and technical investigations is not a great deterrent to the progress of the art of medicine. The keen and discerning mental processes of the clinician must not be dulled by inaction as laboratory reports are reviewed for diagnosis.

Miller says there are certain evils appearing in practice as follows:

(1) "A tendency prematurely to accept and apply new laboratory tests of promise.

(2) "The indiscriminate utilization of accepted laboratory procedure is in reality of value only in a limited domain.

(3) "The improper interpretation of tests of known value through ignorance of their clinical significance.

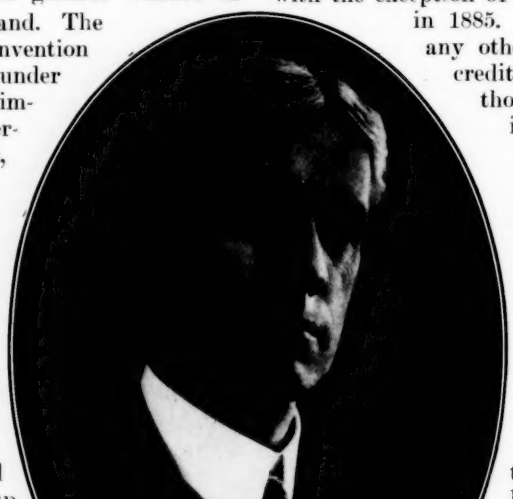
(4) "An unwise reliance on positive laboratory findings to establish a diagnosis to the exclusion of other data that may, perhaps, be much more important."

Specialism also has become a deterrent to clinical progress in medicine, as pointed out by Miller. One would not gainsay that advantages have come to medicine as the result of specialism. One has only to review the march of medicine through the last quarter of a century to note the striking influence of specialism upon medical progress. But Osler's observation is to the point when he said: "The extraordinary development of modern science may be her undoing. Specialism has fragmented the specialties themselves in a way that makes the outlook hazardous. The workers lose all sense of proportion in a maze minutiae." Miller goes on to say: "Specialism can not probably be checked, but unless its abuses are restrained, a dark era in clinical medicine will have to be faced. Sanity extremes never mix."

Again, changes in medical practice, as group clinics, result from modern specialism. Undoubtedly, group practice under well ordered and well defined limitations offers many advantages to both the progress of medicine and the welfare of the people. Fundamentally, the association of specialists or group practitioners, for the purpose of associate study of disease and its treatment, should bring better end results to patients.

The association of specialists under a cooperative plan brings to bear the possibility of making analytical and diagnostic study of

complex cases heretofore not readily accomplished. The grouping of men, however, has certain deterrent influences and these handicaps may as well be faced. These handicaps pertain more to the relationship of practitioners to one another than they do to medical progress. But it must be conceded that no great and lasting improvement can come in medicine, which fundamentally affects harmfully the interests of the general practitioner. The general practitioner is yet the bone and sinew of the medical profession. The general practitioner's interests and the general welfare of the people go hand in hand. The progress of medical invention and medical diagnosis under group medicine can not improve the people's interests, if in this process, the level of intelligence of the general practitioner suffers. The level of intelligence must necessarily parallel the material interests; men of better training can not afford to pursue the vocation of general practitioners if the emoluments are diminished by contact and competition with group practice. But, if group practice can be made an aid and assistance to the general practitioners in practice, assisting in diagnosis and in first steps of therapy in complex cases, backing up the general practitioners in their efforts to induce patients who need careful therapy to take it, opening new channels of thought and directing attention to possible avenues of treatment, then medical practitioners and the general public will be greatly benefited by this new alignment in the profession.



JOHN STAIGE DAVIS, M. A., M. D.

Then, in so far as group medicine assists and supports the general practitioner, it will be an aid and help to medical progress.

Our New President.

Dr. John Staige Davis, the new President of the Medical Society of Virginia, comes of a family long prominent in the professional and educational life of Virginia. His grandfather, John A. G. Davis, was professor of law in the University of Virginia, 1830-1840; his father, Dr. John Staige Davis, was graduated from the University of Virginia in 1840 with the degree of Master of Arts, and in 1841 with the degree of Doctor of Medicine; after medical study and practice elsewhere, he settled in Charlottesville and became Demonstrator of Anatomy in the University of Virginia in 1845. In 1856 he was elected Professor of Anatomy, Materia Medica and Botany, which he taught, with the exception of Botany, until his death in 1885. To him more than to any other one man is due the credit of establishing the thorough work in Anatomy in which the University of Virginia long stood prominent among the medical schools of the country. Even now, thirty-seven years after his death, his reputation as a teacher, physician, and man of culture stands out in the history and traditions of the University. Dr. Cabell said of him: "In the relations of private life he was true and just in all his dealings, faithful to his friends and habitually punctilious in dispensing the courtesies which beautify social intercourse among men."

Our President for 1923, Dr. John Staige Davis, was born in 1866, and thus grew up in an environment of scholarship and culture well suited to bring out the best that was in him. He was graduated as a Master of Arts of the University of Virginia in 1888 and as Doctor of Medicine in 1889. From 1889-91 he taught at Tulane University, New Orleans; '91-'92 was spent abroad in medical study in Berlin and Vienna after which he returned to New Orleans where for one year he was visiting physician to the Charity Hospital. Returning to Charlottesville, he became instructor in medical biology and pathology at the University of Virginia in 1893, and in the following year

he became adjunct professor of pathology and hygiene, a position which he held until 1900. During this period Dr. Davis introduced into the medical course at the University laboratory work in pathology, thus becoming one of the pioneers of the new era which was to transform the medical teaching of his alma mater from the purely didactic to the laboratory type of instruction.

In 1900 Dr. Davis became Professor of the Practice of Medicine at the University a chair which he still holds. His extensive training in modern scientific and practical medicine soon brought him into great demand as a consultant throughout the country accessible to Charlottesville and the reputation thus established contributed largely to the upbuilding of the clinic at the University of Virginia Hospital. Of late years the growth of this clinic and the increase of teaching duties has led him to confine his work largely to the Hospital.

Dr. Davis is an outstanding figure in his University, his community and the state. He is one of those men who brings into every sphere of activity in which he engages a personality which is all his own, a personality which endears him in a peculiar manner to his patients, his students, and his community. One cannot imagine his having an enemy. If called upon to characterize him by one title, probably all who know him would select at once "The Beloved Physician" as most fittingly serving this purpose. The Medical Society of Virginia maintains its allegiance to the highest ideals of our profession in choosing him as its President for the coming year.

Good Roads! Good Roads!! Good Roads!!!

If you want good roads in this State, see your representatives in the legislature now and help the Governor to make up his mind. Note what Governor Trinkle states in a public letter he is willing to do:

"I want to state I am willing to call an extra session of the general assembly for a bond issue, provided the request comes to me from a substantial majority of the members of the general assembly by December 15, 1922, and by a substantial majority, I mean a safe working majority, sufficient to meet the hazards of a legislative body. Or, I am willing to call an extra session of the general assembly for the purpose of raising temporary funds for 1923, or for the purpose of providing funds for 'paying as you go,' provided a substantial majority of the members of the general assembly request the call of the same for either one of the plans.

"For the information of the public I might state that under the constitution, the general assembly can convene on application of two-thirds of the members of both houses and when in session can consider any matters they desire to consider."

News Notes

To All Of Our Readers We Wish A Merry Christmas, and Health, Happiness and Prosperity in the New Year.

Post Graduate Schools for Veterans' Bureau Physicians.

In order to render the best possible professional care and treatment to disabled ex-service men, Colonel C. R. Forbes, Director of the Veterans' Bureau announces that he is about to establish Post Graduate Schools for physicians now connected with the Bureau and those who wish to join this Service.

There will be two Schools for the teaching of the diagnosis, care and treatment of pulmonary tuberculosis, one at Fitzsimons General Hospital, Denver, Colorado, and the other at U. S. Veterans' Hospital No. 41, New Haven, Conn. The courses at these hospitals will be uniform and will run simultaneously. Each course will last two months, and will include collateral branches of medicine such as pathology, x-ray plate interpretation, physiotherapy, etc.

Before attending the Schools physicians now in the Service will be given a preliminary course which will be established under competent instructors in each of the Veterans' Hospitals for tuberculosis. They will then be selected to take the Post Graduate course at Fitzsimons or New Haven. Specialists not connected with the Bureau will be invited to attend and give lectures to the students. It is anticipated that at least three courses of two months' duration each can be run during the year in the east and west.

As more physicians with special knowledge of tuberculosis than are already in the Service will soon be needed it is hoped that this demand will be supplied from the profession at large. Applications for admission to the

Schools with a view to service in Bureau hospitals may be sent to Colonel C. R. Forbes, Director, Veterans' Bureau, Washington, D. C., —Attention Clinical Director of Tuberculosis.

The Southern Medical Association

Held its sixteenth annual meeting in Chattanooga, Tenn., in November, under the presidency of Dr. Seale Harris, of Birmingham, Ala. There was a registered attendance of nearly 1,900 and the meeting was in every way a success. Dr. Walter S. Leathers, Oxford, Miss., was elected president for the coming year; Dr. Lawrence T. Royster, Norfolk, Va., vice-president, and Dr. M. Y. Dabney, Birmingham, Ala., was reappointed editor and publisher of the *Southern Medical Journal*. It was voted to hold the 1923 meeting in Washington, D. C.

Married.

Dr. G. B. Dudley, Jr., Danville, Va., and Miss Priscilla Humbert, Low Moor, Virginia, December 6.

Dr. Charles F. Rinker and Mrs. Louisa D. Hall, both of Upperville, Va., November 15.

Dr. Roger H. DuBose, Roanoke, Va., and Miss Lucy Ross, East Orange, N. J., October 4. Dr. DuBose graduated in Richmond in 1918 as a member of the '18 class of the North Carolina Medical College.

Dr. William Landon Brent, Colonial Beach, Va., and Miss Lucille Lewis, of Birmingham, Ala. They left a few days later for an indefinite tour of Europe.

Dr. John E. Evans, Wilmington, N. C., and Miss Sara Shepherd, Chatham, Va., November 28.

Dr. John Marshall,

Formerly dean of the Medical School of the University of Pennsylvania and professor of toxicology, who retired last June because of having reached the age limit set by the board of trutstees, has been appointed professor emeritus of toxicology and chemistry of that school.

The National Board of Medical Examiners

Announces the following dates for its next examinations:—

Part I: February 12, 13 and 14, 1923.

Part II: February 15 and 16, 1923.

The fees for these examinations have been continued at the reduced rate for another year. Applications for these examinations must be forwarded not later than January 1, 1923. Application blanks and circulars of information may be obtained from the Secretary of the National Board, Dr. J. S. Rodman, Medical Arts Building, Philadelphia, Pa.

Dr. R. H. Fuller,

Clover, Va., we understand is building a hospital in that place for the care of his private practice.

1923 Alvarenga Prize.

As all essays competing for the $300 Alvarenga prize must be in hand in proper form before May 1, 1923, those interested should at once write and secure full details from the secretary, John Girvin, 19 South 22nd Street, Philadelphia, Pa. The prize will be awarded July 14, 1923.

Hospital Fires.

We note from the *Journal of the A. M. A.* that during 1919 and 1920 there occurred 870 fires in institutions classified as hospitals, asylums and sanatoriums, or an average of more than one fire a day in that type of institution.

When it is realized that most fires are preventable, this should be cause for thought and investigation, that the helpless in these institutions may be better safeguarded.

A New Camp of Sons of Confederate Veterans,

To be known as the Dr. Thomas Lee Settle Camp, was organized at Upperville, Va., November 23. Dr. E. A. Moore, Marshall, was elected commandant, and Dr. Frederick Gochnauer, Upperville, first lieutenant-commander.

The Abbott Laboratories,

Of Chicago, have purchased the Dermatological Research Laboratories of Philadelphia, and took over the control of them on November 1. They will continue to be operated in Philadelphia, under the direction of Dr. Geo. W. Raiziss, head of the Department of Chemistry, and his corps of specially trained assistants. The Dermatological Research Laboratories were the first in the United States to produce Arsphenamine during the war when there was such a scarcity of this article. As explained in the Abbott advertisement, orders for "Dri" products will be filled from the Philadelphia Laboratories or from the home office of the Abbott Laboratories in Chicago.

S. C. Chiropractor Fined.

It was announced that a Charleston, S. C., chiropractor was recently found guilty of practicing medicine without a license and, as he had formerly been convicted under a similar charge, the judge imposed a sentence of ninety days in jail or a fine of $300.

Asiatic Cholera Reduced in Russia.

Asiatic cholera has been so successfully combated in Russia by a wholesale inoculation of the people, under the auspices of the American Relief Administration, that the disease now seems on the wane. In the Volga basin and the districts of Orenburg and Ufa, where in 1921 there were 93,784 recorded cases of Asiatic cholera, there were this summer only 5,386 cases, or a decrease of more than 94 per cent. for that area.

The Virginia Society of Oto-Laryngology and Ophthalmology

Held its meeting at Norfolk, November 1, 1922. The following were elected officers for the ensuing year: Dr. Elbyrne Gill, Roanoke, President: Dr. Joseph A. White, Richmond, Vice-President; Dr. Emanuel U. Wallerstein, Richmond, Secretary-Treasurer.

Hereafter, meetings will be held once a year. The next meeting is scheduled for sometime in April at Richmond. The exact date is to be fixed by the Executive Committee and will be announced later.

Hynson, Westcott & Dunning,

The well known drug firm of Baltimore, has just erected and moved into its own building at Charles and Chase Streets, that city. The building is artistic in appearance and adapted to accommodate the several departments of their rapidly developing business, which began in a small way in 1889 and has now grown to a million a year, with an organization of 125 people. Their unique sales department alone comprises 19 men who visit physicians in all parts of the United States, but do not sell goods. Thirty-five of their products have been accepted by the Council, and are advertised in this journal. Mr. H. R. Hynson, one of the founders, died in 1921, but their growing business is now under the immediate supervision of Messrs. James W. Westcott and H. A. B. Dunning.

The Kentucky State Medical Association,

At its annual meeting, held recently in Paducah, elected Dr. Frank Boyd, of Paducah, president for the ensuing year, and re-elected Dr. Arthur T. McCormack, of Louisville, secretary.

Dr. Henry C. Carson,

Recently of Exeter, Va., announces that his post-office is now Dunbar, Wise County, Va.

Dr. George B. Martin,

Formerly of this city, after spending over three years at the U. S. Public Health Hospital, Oteen, N. C., has moved into a home of his own just outside of Ashevile, N. C.

Dr. William R. Weisiger,

After a service of three years on the House Staff of the Manhattan Eye, Ear and Throat Hospital, New York City, has returned to Richmond and will limit his work to the above named specialties. He has offices at 416 Methodist Publishing Building.

Dr. Samuel Newman,

Formerly of Danville, Va., has completed his work in Poland as Medical Commissioner for Congress Poland of the American Joint Distribution Committee, and is now studying nutrition problems in the University of Vienna.

Dr. W. A. Lucas,

Who has been located at Pulaski, Va., since returning from service in the World War, has located in Knoxville, Tenn. with offiees at 425 West Clinch Street.

Dr. Cullen S. Pitt,

Of this city, announces the removal of his offices to 2101 Grove Avenue.

Dr. Hamilton J. Slusher,

Recently of Boissevain, Va., has located in New Market, Maryland, where he will continue the practice of his profession.

1921 Death Rates.

Compilations made by the Bureau of the Census indicate that 1921 was a remarkably healthful year. Record low death rates appear for nearly all areas. The trend of the tuberculosis death rate was downward, while that for cancer still increases. There has been an increase in the number of fatalities resulting from accidents caused by automobiles and other motor vehicles of 41.2 per cent. from 1917 to 1921.

The Near East Relief Campaign

Is now one of the most worthy causes before the people of this country. Five dollars

saves the life of a child in the Near East for a month, or sixty dollars for a year. Seventeen cents saves one life for a day. "Lend a hand!"

The North Carolina Hospital Association

Held its annual meeting at Wilson, November 2, under the presidency of Dr. John A. Williams, of Greensboro. Dr. Eugene B. Glenn, Asheville, was elected president for the coming year, Dr. Chas. A. Woodard, Wilson, vice-president, and Dr. James R. Aleqander, Charlotte, secretary-treasurer.

The Mississippi Valley Medical Association,

At its annual meeting in Rochester, Minn., in October, elected for its new president Dr. Henry Enos Tuley, of Louisville, Ky., who had been secretary of the Association for the past twenty-five years. Dr. Tuley was prevented from attending this meeting by illness. Dr. John L. Tierney, St. Louis, was elected secretary of the Association. The next meeting is scheduled to be held at Hot Springs, Ark.

Dr. Fitzhugh L. Banks,

Formerly of this State and a graduate of the '09 class, Medical College of Virginia, after several years spent at Slab Fork, W. Va., has moved to Richmond. He is located on Three Chopt Road, Westhampton, and is engaged in general practice. Dr. Banks also has offices in the Professional Building, this city.

Health Board For Fredericksburg.

The Fredericksburg, Va., Board of Health was recently reorganized with W. A. Bell as president. Drs. Lee Cooke and F. T. Cassiday were the doctors elected as members. Dr. J. N. Barney is health officer of the city and in this way a member of the Board.

Dr. Joseph T. McKinney,

Roanoke, Va., announces removal of his offices from MacBain Building to 618-620 Anchor Building, that city.

Associated With Dr. W. B. Hopkins.

Dr. William Patterson, recently of Danville, and Dr. Edwin N. Maner, of Atlanta, Ga., of the class of '17, Emory University, are associated with Dr. W. B. Hopkins of Richmond, in the treatment of diseases of the eye, ear, nose and throat.

Dr. Charles W. Putney

Has located in Covington, Va., where he will be engaged in general practice. Dr. Putney was graduated from the Medical College of Virginia in 1921, after which he served an interneship at Grace Hospital, New Haven, Conn.

Va., of the '07 class, University of Virginia,

Dr. Richard B. Whitaker,

Of Whiteville, N. C., a graduate of the former University College of Medicine of Richmond, in the class of '12, has been elected vice-president of the Columbus County (N. C.) Medical Society.

The American Medical Editors' Association

Held its fifty-third annual meeting in Cleveland, October 16 and 17, under the presidency of Dr. Frank C. Lewis, of New York. The papers read were up to the usual high mark. The annual banquet was held on the first evening. Dr. Henry O. Marcy, of Boston, was elected president; Dr. Chas. J. Whalen, of Chicago, first vice-president; Dr. F. H. McMechan, of Avon Lake, O., was re-elected secretary-treasurer; and Dr. H. Edwin Lewis, of New York, was elected chairman of the executive committee.

The Association of Surgeons of the Chesapeake and Ohio Railway

Held their sixth annual meeting at White Sulphur Springs, W. Va., November 17 and 18, with an attendance of one hundred. The scientific program was up to its usual good mark. Officers elected for the ensuing year are:—President, Dr. S. W. Hobson, Newport News, Va.; Vice-Presidents, Dr. C. C. Coleman, Richmond, Va., Dr. R. K. Buford, Charleston, W. Va., and Dr. C. E. Wamsley, Newport, Ky; Secretary-Treasurer, Mr. G. E. Meanley, Richmond, Va.

Members of the Executive Committee are: Drs. J. M. Salmon, Ashland, Ky.; Oscar Bloch, Louisville, Ky.; E. D. Allgaier, Cincinnati, Ohio; G. S. Hartley, Clifton Forge, Va.; Wm. A. Buchanan, Hammond, Ind.; and R. J. Wilkinson, Huntington, W. Va.

The place for the next meeting is to be decided upon later.

Xmas T. B. Seals.

Have you bought Christmas Seals to help in the fight against tuberculosis? They are still on sale all through the State and your mite will help a good cause. Get your seals today!

To organize a Medical Society in the Clinch Valley.

A movement is on foot to organize a Medical Society along the Clinch Valley division of the Norfolk and Western and Louisville and Nashville Railroads, composed of the counties of Tazewell, Buchanan, Russell, Dickenson, Wise and Lee. This society will be similar to the Southwestern Medical Society, comprising counties along the Norfolk and Western Railroad from Bristol to Roanoke. Each county in the State is supposed to maintain an organization which is a component of the State Society, but it has been found that it is very difficult to hold meetings in the counties where only a few doctors are located.

In these counties there are about 135 active practitioners who, if they so elect, can form an active organization which can do good scientive work and greatly improve and strengthen the profession in this locality. Such a society could at times arrange joint meetings with the Southwestern Virginia Medical Society, or the Mercer County (W. Va.) Society, both active and progressive societies with from 75 to 150 members.

Dr. J. A. McQuire, of Norton, Virginia, Dr. S. C. Couch, of Cleveland, Va., and Dr. Isaac Peirce of Tazewell, Va., are sending cards to the doctors in their immediate locality, asking for an expression of opinion, and it is hoped they will get a prompt and favorable response, and meet with hearty co-operation in their efforts to organize the new society.

The National Association of Police and Fire Surgeons and Medical Directors of Civil Service Commissions

Was organized at a meeting in Philadelphia on November 20. Its aims and purposes include the study and solution of all problems of a medical nature involved in police and fire department work. The standardization of the requirements is one of the first problems which will engage the attention of the Association. Atlantic City, N. J., was selected for the place of meeting in next September, and Dr. Hubley R. Owen, chief police surgeon of Philadelphia, was elected first president of the Association.

Dr. and Mrs. B. L. Phillips,

Of this city, returned home the latter part of November from Palmyra, Va., where the doctor went on a hunting trip.

Dr. G. W. Brown,

Superintendent of Eastern State Hospital, Williamsburg, Va., is much improved after a recent illness.

Officers of Club.

Dr. Garnett Nelson has been elected president of the University Club of Richmond, for the ensuing year, and Dr. L. J. Whitehead was elected one of the directors.

Dr. Claude N. Rucker,

Formerly of Clifton Forge, Va., but now of Danville, Va., has been appointed captain of the medical corps, Virginia National Guard, and assigned to duty with Hospital Company No. 10, Danville, to succeed Captain William Patterson, transferred to the unassigned list on account of his removal to Richmond, Va.

Dr. Edward Magruder,

Charlottesville, Va., has been re-elected national chieftan of the American Clan McGregor Society, which position he has held since its organization in 1909.

Dr. and Mrs. J. M. Bland,

Boykins, Va., stopped for a visit in Richmond on their way to atend the conference of the World's Women's Christian Temperance Union, in Philadelphia.

Dr. Harry E. Brooks,

Of the class of '17, Medical College of Virginia, has located at Clayton, N. C., after practicing for sometime at Sunbury, N. C.

Bigelow Medal Given Dr. Keen.

Dr. W. W. Keen, of Philadelphia, is the recipient of the second Henry Jacob Bigelow medal, given by the Boston Surgical Society. The first medal was bestowed upon Dr. William J. Mayo.

New Sanitarium Destroyed By Fire.

The Alleghany Sanitarium at Goshen, Va., was destroyed by fire on November 30, the loss being estimated at between $100,000 and $150,000, only partly covered by insurance. This building was formerly run as a summer hotel but was recently purchased by a corporation formed of Northern men with a view to remodeling and opening it as a sanitarium.

Wanted:

Position as doctor's office assistant by an undergraduate nurse with a knowledge of stenography and routine laboratory work.

Splendid recommendations. Willing to start on moderate salary. Address "C. J. M."; care this journal. (Adv.)

Physician Wanted.

Wanted a physician in one of the most prosperous sections of the Eastern Shore of Virginia. Can do well from the start and make money. Must be energetic and up-to-date. Refer to Dr. L. F. James, 424 North 25th Street, Richmond, Va. (Adv.)

Obituary

Dr. John J. Terrell,

Intimately connected with the history of Lynchburg, Va., and community for many years, died at his home in Campbell County, November 7, at the age of 93 years. He was born in Patrick County, Va., and when a boy moved to Campbell County where he had since made his home. Upon completion of his academic education, Dr. Terrell studied medicine and received his diploma from Jefferson Medical College in 1853. He saw service in the Mexican War and in the War Between the States. During the latter, he was one of two assistant surgeons in charge of Confederate hospitals in Lynchburg. He was one of the oldest Masons in the State, had served in the General Assembly from Campbell County, and was identified with many interests in that section. He was an honorary member of the Medical Society of Virginia.

Dr. Terrell's wife preceded him to the grave by three years. About six months before her death they celebrated their sixty-second anniversary. Dr. Terrell is survived by two daughters and three sons, two of them being Dr. A. W. Terrell, of Lynchburg, and Dr. T. K. Terrell, of Campbell County.

Dr. William S. Cline

Died November 19 at his home in Woodstock, Va., at the age of 78 years. His ill health dated from a fall about six months ago, since which time he had failed rapidly. He is survived by one daughter.

Dr. Harry Richard Smith

Died suddenly at his home in Appalachia, Va., November 27, death being due to a stroke of apoplexy. He was thirty-six years of age and had received his medical education at the Kentucky School of Medicine, Louisville, from which he graduated in 1908. He was a member of the Wise County Medical Society and had been a member of the Medical Society of Virginia since 1910. His wife and mother survive him.

Resolutions on the Death of Dr. Harry R. Smith.

The following resolutions and preamble were adopted at the last meeting of the Wise County Medical Society:

WHEREAS, It has pleased the all-wise and just God to remove from our midst a most loyal member, and a devoted, esteemed and skilled physician, Dr. Harry R. Smith, who died at his home, Appalachia, Va., on the morning of November 27th, from a sudden stroke of apoplexy, at the age of 36; be it

RESOLVED, That this Society desires to place on record its deepest sorrow for the loss it has sustained, and be it further

RESOLVED, That these resolutions be spread upon the minutes, published in his home paper, and the *Virginia Medical Monthly*, and that a copy be forwarded to his bereaved wife and mother, to whom we tender our most profound sympathy.

C. B. BOWYER,
R. W. HOLLEY,
J. H. HAGY,
Committee.

Dr. Harry C. Cline,

Of Front Royal, Va., died September 29, of pernicious anemia, at the University of Virginia Hospital. He was born in Front Royal, November 16, 1844, and, after completing his academic education there and at Roanoke College, he studied medicine at the University of Maryland, from which he graduated in 1876. He had been a member of the Medical Society of Virginia since 1889.

Dr. Massie L. McCue,

Of Greenwood, Va., died November 15, at the age of 74 years, death being due to apoplexy. He was graduated from the University of Virginia Medical School in 1873 and had practiced his profession in Albemarle County until about ten years ago when he was forced to retire on account of failing health. He was widely known as a fruit grower and was for many years president of the Virginia Horticultural Society. He is survived by his wife and a son.

Dr. Frank Aikman Jones,

A widely known diagnostician of Memphis, Tenn., and an ex-president of the Southern Medical Association, died at his home in that city, November 23. Dr. Jones was 55 years of age and studied medicine at Louisville Medical College, from which he graduated in 1890. He was one of the organizers of the Southern Medical Association and always one of its most active workers.